

parents and told them all. They were sorry, but they recognized the uselessness of opposition; and since they could not help the matter, resolved to make the best of it.

Marcia's strong will conquered all obstacles. Just at sunset of the glad June day she stood by Guy Saltonstall's side while her brief marriage vows were spoken. With what tender pride she looked on her wan, ghostly bridegroom! In his glory of manly strength and lofty courage he could never have seemed to her nobler or more worthy. She had never been more beautiful. Her violet eyes full of light and love, pink flushes on her cheeks, rays of sunset in her rippling chestnut hair, and on her simple white muslin dress, she looked a bride for any man's worship. But it seemed pitiful to see such youth and grace, such beauty and such tender truth given to the clasp of death. How soon would the earth, and not that bright head, lie on his bosom? I know I wasted pity. If ever woman spoke her marriage vows with full and joyful surrender, Marcia so spoke them.

That was June, and now it is October. The "Cool Captain" is not dead, thanks to Marcia's nursing. He will never have his old strength back—never again lead on his men where muskets rattled and bugles call; but he is well enough to enjoy the pomp of the autumn days, and reflect back in his smile the deep contentment of Marcia's eyes. And when I see her so happy, I think she understood her own needs best after all.

HOW I OVERCAME MY GRAVITY.

I HAVE all my life been dallying with science. I have coquetted with electricity, and had a serious flirtation with pneumatics. I have never discovered any thing, nevertheless I am continually experimentalizing. My chambers are like the Hall of Physics in a University. Air-pumps, pendulums, prisms, galvanic batteries, horse-shoe magnets with big weights continually suspended to them: in short, all the paraphernalia of a modern man of science are strewn here and there, or stowed away on shelves, much to the disgust of the maid-servant, who on cleaning-day longs to enter the sanctuary, yet dare not trust her broom amidst such brittle furniture. To survey my rooms, you would infallibly set me down as a cross between Faraday and Professor Morse. I dabble in all branches of Natural Philosophy. I am continually decomposing water with electricity, and combining gases until they emit the most horrible odors. I have had four serious explosions in my laboratory, and have received various warnings from the Fire Marshal. The last was occasioned by the obstinacy of an Irish maid-servant, who, happening to behold a large mass of phosphorus in the dark, would insist on "putting it out" with a pail of water. The consequence was, of course, a conflagration that was near destroying

the entire establishment. My friends visit me with fear and trembling. They are never certain that the bell-pull may not be the pole of an electro-magnetic battery, and when they seat themselves in a chair seem to expect some unwonted phenomenon to exhibit itself. You will at once perceive, therefore, that I am an enthusiast. People when they pass me in the street point me out to their friends, and whisper, "Very clever man, but *so* eccentric!" I have gotten an immense reputation for ability, yet I don't believe that my best friend would trust me with the management of the most trivial business matter. Nor am I so much surprised at this. I will confess that I am continually suffering losses on my own little property, and it would seem my fate to form relations with all the bankrupts and swindlers in the United States. These drains on my estate I always hoped to make good by an invention. I am a very worldly fellow at bottom, let me tell you, notwithstanding all my scientific pranks. I keep an eye out for the main chance; and I always held the hope that even when my affairs were going most to ruin I would eventually light upon some lucky discovery which would make every thing right again. There's Professor Morse. He lit upon an invention, and see what's the result. Why, he's asked over to Moscow by the Emperor of Russia to be present at his coronation, and is given a palace to live in, with a whole Ukraine of horses and Cossacks at his disposal!

For a long time I had turned my attention to solving the problem of aerial locomotion. I fancy even now that I hit the white when I enunciated my grand principle of progression by means of atmospheric inclined planes; and at the time I made a model of a machine which illustrated my theory very fairly, but I had not capital enough for experiments on a large scale; and so great was the prejudice against all kinds of ballooning among moneyed men that I could not find the means to exploit what is incontestably a great physical truth.

One day as I was walking down Mercer Street, in the neighborhood of Bleecker, I came opposite to the establishment of Chilton, the chemist, which stood on the corner. Revolving a thousand formless projects in my brain, my eyes, wandering like my mind, happened to light on the open door of the chemist's store. There, on a table placed a little way inside the entrance, I beheld a number of brass instruments lying, the shape and construction of which I was unfamiliar with. Idly and half-mechanically I crossed over and entered the store for the purpose of examining them. The young man in attendance advanced to meet me—for I am known as a sort of amateur *savant*—and asked how he could serve me.

"What is this?" I asked, taking one of the instruments that had attracted my attention from the table. "It seems to me to be some novelty."

"It is truly a novelty," said my friend, the budding chemist. "It is a trifle—an ingenious trifle, certainly—discovered by a Connecticut

genius, and its operations have as yet been entirely unaccounted for."

"Ah!" I cried, becoming suddenly interested, "let us look."

The machine which I held in my hand may be thus briefly described. Imagine a brass globe, some three inches in diameter, having its axis playing in a narrow but tolerably thick rim of brass, just as a terrestrial globe revolves in its horizon. The only difference being that the globe was not central in the rim, or horizon; one of its poles being nearer to the end of its axis than the other. This peculiarity, I afterward discovered, was not essential to its working, being merely a matter of convenience. The remainder of the apparatus consisted of an upright steel rod, fixed in a heavy wooden platform, candlestick fashion, and pointed like an electrical conductor.

"How does it work," I asked, after examining it attentively, "and what principle does it illustrate?"

"It overthrows an established principle," answered my young friend, "and I am not clear as to what one it gives in place of it."

"Let us see it."

"Willingly."

So saying the young man took the globe, which revolved with little friction in its brass horizon, and winding a string round that portion of the axis which occupied the greatest space between the globe and ring, held the latter against his breast, and pulling the string violently, as boys pull the string of a humming-top, caused the globe to revolve with marvelous swiftness on its axis. The globe being thus in a rapid state of revolution in its horizon, he now showed me on the under surface of the last, and in a right line with the poles of the axis, a small cavity drilled, which admitted of the machine being placed on the upright pointed steel rod, without any chance of slipping. This cavity was *not a hole*, only an indentation in which the point of the upright rod fitted, just as the axle of a watch wheel is received into the jewel. When this pivot, so to speak, was placed by the young chemist on the steel-pointed rod, the globe and its horizon, to my utter astonishment, proceeded to revolve in a plane at right angles to the revolution of the globe! There was a weight of some six pounds supporting itself in the air, and revolving with a regular motion! If my reader will take a long wedge of iron, heavier at one end than the other, and place the light end on the point of a rod stuck into the earth, and at right angles with it, and then conceive that wedge of iron revolving around the point where it touches the upright rod, he will have a pretty clear idea of the marvel which I witnessed at Mr. Chilton's.

The attraction of gravitation then was overcome! In the same position in which I saw it maintaining itself, if the revolution of the brass globe was checked the whole apparatus would instantly tumble to the earth. Why, then, did the simple centrifugal force of the globe enable it

to thus marvelously poise itself in air? I was bewildered, and though my brain, from habit of dealing with problems, instantly groped for a reason, it could find none satisfactory.

"Has no explanation been offered of this wonder?" I asked the chemist.

"None, Sir," was the reply; "at least none that were in the least logical or conclusive. Several people have sent us elaborate explanations, but when all have been divested of their scientific phraseology, they amount but to one arbitrary assertion of the fact that it revolves contradictorily to the laws of gravitation."

I bought one of the toys and went home. I was lost in wonder. What became of Newton's famous apple now? It was rotten to its core. Had the wind or some other subtle power impressed upon it such a force as to cause it to revolve with immense rapidity it would never have fallen, and Newton would never have discovered the so-called principle of the attraction of gravitation.

The more I pondered the more the marvel grew upon me. I spun the toy for hours, and was never weary of beholding it move in its appointed circle, self-sustaining and mysterious. After all, I considered it as only wonderful to me, because I have been so long in the habit of accepting the theory of gravitation as an established fact. This new force, whatever it is that supports this toy in air, is not a whit more mysterious than the assumed force which is said to draw all things toward the centre of the earth, and keep the planets in their places. Ask what it is, and people tell you "the attraction of gravitation." Ask them what "the attraction of gravitation" is, and they will tell you "the force which draws matter to the centre of the earth," and so the game of science runs. Arbitrary names are forced on you as facts. From battledore to battledore the shuttlecock is sent flying. The result becomes the definition and the explanation.

It was in one of those moods of mind in which a man sometimes finds himself, groping for day through a horrible and oppressive darkness, yet certain that the chink through which it will flow lies somewhere within reach, that I suddenly lit upon the conviction that in this new discovery I held the secret of aerial locomotion!

I argued in this way: If a violent rotary motion is sufficient to overcome the gravitating tendency of brass, it surely is that of human flesh. Neither is it at all necessary that the body of the person wishing to soar aloft should itself revolve. That would be fatal to life. But here, in this toy, I see the revolution of a brass globe supporting a heavy brass horizon, and if I were to put another weight, say a cent, on that brass horizon, it would still be supported; therefore if a machine on the same principle, and proportionately large, be constructed, it will support a man as this supports a cent. I had lit upon the truth that "a body revolving on its own axis with sufficient velocity becomes self-

supporting, and can be impressed with a force that shall impel it in any given direction!"

With all the fever of a man of science and an enthusiast I set to work. My machine cost me long nights of labor and brain-work. I will endeavor to describe it.

It was a copper globe of vast dimensions, hollow inside, and traversed by a huge axis, which buried its poles into an enormous horizon of iron. In the interior of this globe, parallel with the axis and a little above it, ran a false axis, also of iron, but playing loosely in holes bored in the globe itself, so that when the globe revolved this axis did not turn. On this bar of iron was placed a seat, which was intended for my own accommodation. This arrangement, it will be perceived, insured to any person placed on the seat an equilibrium, no matter how quickly the globe by which he was surrounded revolved. It was, in fact, the same principle on which ships' lamps are suspended. There the lamp always remains horizontal, no matter how heavily the vessel rolls.

The machinery by which the globe was caused to revolve on its axis is much too complicated to admit of any description unaccompanied with diagrams; suffice it to say, that it was so powerful as to insure a revolution of this enormous copper sphere at the rate of sixty times in a second. A vast iron pillar, answering to the upright steel rod of the toy, I had also constructed. This was destined to receive and sustain the brass horizon. A machine constructed after the manner of the ancient catapult was also arranged for the purpose of launching the globe into air so soon as it had attained the necessary revolutionary velocity. The power of this catapult was cunningly graduated to certain distances. Assuming that the globe while revolving possessed no weight, it would with a slight push travel forever through space unless the resistance of the atmosphere lessened and conquered its motion. But the globe would only revolve for a certain time, and in proportion as the velocity of revolution decreased so would its tendencies to the earth return; thus knowing precisely how long this velocity would last, and in what ratio it would decrease, I was enabled to calculate to a pound what force to impress upon it by the aid of the catapult, in order to send it any given distance.

Every thing being complete, and having invited a few friends to witness the experiment, I took my seat on the false axis with a beating heart, and gave the signal by which the attendants were to set the globe in motion. In an instant the copper sphere was whirling around me with a velocity that I could not measure, but could only guess at from the humming noise that to me in the interior sounded like the thunder of a thousand skies. The interior of the globe was lit by pieces of massive flint glass set firmly in a belt form round the centre. These windows, from the rapidity of motion, blended

together in a zone of light that flashed continually before my sight. My seat on the axis, poised in the midst of this terrible whirl, remained steady and unaltered. Suddenly I felt a jerk, a singular sensation quivered through my frame, and, rather by instinct than sensation, I knew that the catapult had launched me into space.

I had calculated my distance for St. Paul's, Minnesota, and had accordingly set the catapult to the scale of force necessary to cast the globe that distance, making the proper allowance for the decrease of velocity. Would I succeed? I confess at this moment I felt grave doubts. A thousand things might happen. The theory was perfect, but how many perfect theories had failed in practice! My elevation might be improperly calculated, and the machine be dashed to pieces against some intervening mountain. A few seconds would, however, decide all, as I had calculated that the journey would not consume more than four minutes and a half.

While occupied with these considerations I chanced to glance at the belt of light formed by the quickly-revolving windows. It seemed to me to have changed its shape strangely. Instead of its previous regularity of form, it had become, as it were, ragged and uneven. On looking closer, and examining it as narrowly as I could examine any thing passing in such rapid revolution, I fancied that I saw it widen gradually before my eyes. And, as if to confirm my suspicions, a blast of cold air fell on my cheek, and immediately after a hollow roaring filled the globe.

The horrid truth burst upon me. I had forgotten to make the solidity of the copper globe more than equal to the centrifugal force, and the machine was bursting to pieces when I was at my highest elevation.

My brain seemed to whirl with the globe on making this discovery, and with staring eyes I glared at the awful rent that was so rapidly increasing. A hurly-burly like that of the infernal regions filled my ears. It was the air rushing into the globe. Then came a crash and a horrid splitting sound. Instinctively I grasped the immovable axis on which I was seated. Another crash, and I saw dimly the huge mass of copper surrounding me fly into a thousand vast fragments, and I knew that I was falling. I gave one wild shriek, and—

"Mr. Wisp! Mr. Wisp! What are you doing? Let the tea-urn alone, Mr. Wisp!"

I looked up from the carpet on which I was lying, and saw my wife, Mrs. William Wisp, extricating the silver tea-urn—fortunately not filled—from my embraces. I was never able to explain to the good woman why I abstracted that article of plate from the side-table during my dream; and for the first time in the history of science an inventor was to be found congratulating himself that his invention had not succeeded.