

GLEANINGS

IN BEE CULTURE

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What hath God wrought?—NUM. 23:23.

Dear friends, I have a wonderful story to tell you—a story that, in some respects, out-rivals the Arabian Nights fables—a story, too, with a moral that I think many of the younger ones need, and perhaps some of the older ones too if they will heed it. God in his great mercy has permitted me to be, at least somewhat, instrumental in ushering in and introducing to the great wide world an invention that may outrank the electric cars, the automobiles, and all other methods of travel, and one which may fairly take a place beside the telephone and wireless telegraphy. Am I claiming a good deal? Well, I will tell my story, and you shall be the judge. In order to make the story a helpful one I may stop and turn aside a good many times to point a moral.

In our issue for Sept. 1 I told you of two young men, two farmer's boys, who love machinery, down in the central part of Ohio. I am now going to tell you something of two other boys, a *minister's* boys, who love machinery, and who are interested in the modern developments of science and art. Their names are Orville and Wilbur Wright, of Dayton, Ohio. I made mention of them and their work on page 241 of our issue for March 1 last. You may remember it. These two, perhaps by accident, or may be as a matter of taste, began studying the flights of birds and insects. From this they turned their attention to what has been done in the way of enabling men to fly. They not only studied nature, but they procured the best books, and I think I may say all the papers, the world contains on this subject. When I first became acquainted with them, and expressed a wish to read up all there was on the subject, they showed me a library that astonished me; and I soon found they were thoroughly versed, not only in regard to our present knowledge, but every thing that had been done in the past. These boys (they are men now), instead of spending their summer vacation with crowds, and with such crowds as are often questionable, as so many do, went away by themselves to a desert place by the seacoast. You and I have in years past found enjoyment and health in sliding down hill on the snow; but these boys went off to that sandy waste on the Atlantic coast to slide down hill too; but instead of sliding on snow and ice they slid *on air*. With a gliding machine made of sticks and cloth they learned to glide and soar from the top of a hill to the bottom; and by making not only hundreds but *more than a thousand* experiments, they became so proficient in guiding these gliding machines that they could sail like a bird, and control its movements up and down as well as sidewise. Now, this was not altogether

for fun or boys' play.* They had a purpose in view. I want to stop right here to draw one of my morals. If I allude to myself somewhat, please do not think I do it because I wish to boast. Some of you have read or heard me tell of the time when my attention was first called to bees. Almost the first thing I did was to go to the book-stores and see what *books* were to be found on the subject. I studied these books day and night, and read them over and over again. Then I procured the books and bee-journals from the old world; and when the language was something I could not manage I hired an interpreter to translate for me until I knew pretty nearly what the book contained. In less than one year I was in touch with the progressive bee-keepers of the world; and the *American Bee Journal*, that had been dropped for lack of support, was started up again. I mention this to show you that my success in bee culture, from the very first, was not luck or chance. It was the result of untiring energy and work. Now let me draw a contrast. During the years that are past, quite a number of men have come to me with their patented hives. A good many of these men had never seen a bee-journal. Some of them who had paid out their hard earnings to the Patent Office had almost never seen a book on bee culture, and they were not sure, from actual experience, of the existence of the queen-bee. We have inventors at the present time who are giving their lives and money to the four winds in the same poor foolish way. If you wish to make a success of any thing, or in any line among the many lines that lie before us in this great world of ours, find out what the great and good men have done in this special line before you.

Well, these two men spent several summers in that wild place, secure from intrusion, with their gliding machine. When they became experts they brought in, as they had planned to do, a gasoline-engine to furnish power, and made a little success with their apparatus before winter set. As soon as the weather would permit, their experiments were resumed the past season. You may have seen something in regard to it in the papers; but as their purpose has been from the beginning to the end to avoid publicity, the great outside world has had but very little opportunity of knowing what is going on. The conditions were so different after applying power that it seemed at first, to a great extent, as if they would have to learn the trade of guiding their little ship all over again. At first they went only a few hundred feet; and as the opportunity for practice in guiding and controlling it was only a few seconds at a time, their progress

* When I suggested that, even though sliding down hill on the air was very nice, it must have been quite a task to carry the machine back to the top of the hill every time, the reply was something like this: "Oh! no, Mr. Root—no task at all. Just remember that we always sail *against* the wind; and by a little shifting of the position, the wind does the greater part of the work in carrying it back." It just blows it back (whenever the wind is strong enough) up hill to the starting-point.

was necessarily very slow. Let me digress again just a little.

I do not know exactly how many years ago it was, perhaps something like thirty, that I saw in the *Scientific American* that they had in France what was called at that time a velocipede. As soon as I saw the description I sent an order for one, and I think I had about the first machine in the semblance of a bicycle that was ever in Ohio—perhaps one of the first brought into the United States. The machine cost over \$100; and as it was a heavy affair, the express on it cost quite an item more. When it came to hand, after days and weeks of anxious waiting, neither myself nor anybody else could ride it at all. The whole town jeered at me, and the story of the “fool and his money” was hurled in my teeth so many times I almost dread to hear it even yet. Men of good fair understanding pointed their fingers at me, and said that anybody of good common sense ought to know that *that* thing would not stand up with a man on it, for that would be an utter impossibility. I worked at it, the crowd in my way, for several hours in the morning. Finally I rented the largest hall in the town, went in with one trusty boy who had faith, for a companion, and *locked the door*. After quite a little practice on the smooth floor of the hall I succeeded in riding from one end to the other; but I could not turn the corners. When, after still more practice, I did turn one corner without falling, how my spirits arose! A little later I went in a wobbly way clear around the room. Then my companion did the same thing, and, oh how we did rejoice and gather faith! A little later on, with a flushed but happy face, I went out into the street and rode around the public square. You can guess the rest of it. Well, these boys wanted just the same kind of privacy to try their flying-machine that I needed for my velocipede; but as it measures about forty feet from the tip of one wing to the tip of the other, instead of a large hall they wanted a large level field in some out-of-the-way place. I found them in a pasture lot of 87 acres, a little over half a mile long and nearly as broad. The few people who occasionally got a glimpse of the experiments, evidently considered it only another Darius Green, but I recognized at once they were really *scientific explorers* who were serving the world in much the same way that Columbus did when he discovered America, and just the same way that Edison, Marconi, and a host of others have done all along through the ages.

In running an automobile or a bicycle you have to manage the steering only to the right and left; but an air-ship has to be steered up and down also. When I first saw the apparatus it persisted in going up and down like the waves of the sea. Sometimes it would dig its nose in the dirt, almost in spite of the engineer. After repeated experiments it was finally cured of its foolish tricks, and was made to go like a steady

old horse. This work, mind you, was all new. Nobody living could give them any advice. It was like exploring a new and unknown domain. Shall I tell you how they cured it of bobbing up and down? Simply by loading its nose or front steering-apparatus with cast iron. In my ignorance I thought the engine was not large enough; but when *fifty pounds* of iron was fastened to its “nose” (as I will persist in calling it), it came down to a tolerably straight line and carried the burden with ease. There was a reason for this that I can not explain here. Other experiments had to be made in turning from right to left; and, to make the matter short, it was my privilege, on the 20th day of September, 1904, to see the first successful trip of an airship, without a balloon to sustain it, that the world has ever made, that is, to turn the corners and come back to the starting-point. During all of these experiments they have kept so near the soft marshy ground that a fall would be no serious accident, either to the machine or its occupant. In fact, so carefully have they managed, that, during these years of experimenting, nothing has happened to do any serious damage to the machine nor to give the boys more than what might be called a severe scratch. I think great praise is due them along this very line. They have been prudent and cautious. I told you there was not another machine equal to such a task as I have mentioned, *on the face of the earth*; and, furthermore, just now as I dictate there is probably not another man besides these two who has learned the trick of controlling it. In making this last trip of rounding the circle, the machine was kept near the ground, except in making the turns. If you will watch a large bird when it swings around in a circle you will see its wings are tipped up at an incline. This machine must follow the same rule; and to clear the tip of the inside wing it was found necessary to rise to a height of perhaps 20 or 25 feet. When the engine is shut off, the apparatus glides to the ground very quietly, and alights on something much like a pair of light sled-runners, sliding over the grassy surface perhaps a rod or more. Whenever it is necessary to slow up the speed before alighting, you turn the nose up hill. It will then climb right up on the air until the momentum is exhausted, when, by skillful management, it can be dropped as lightly as a feather.

Since the above was written they have twice succeeded in making four complete circles without alighting, each circle passing the starting-point. These circles are nearly a mile in circumference each; and the last flight made, Dec. 1, could have been prolonged indefinitely had it not been that the rudder was in such position it cramped the hand of the operator so he was obliged to alight. The longest flight took only five minutes and four seconds by the watch. Over one hundred flights have been made during the past summer. Some of them reached perhaps 50 or 60 feet above ground. On both these long trips *seventy pounds* in-

stead of fifty of cast iron was carried on the "nose."

Everybody is ready to say, "Well, what use is it? what good will it do?" These are questions no man can answer as yet. However, I will give you a suggestion or two. The man who made this last trip said there was no difficulty whatever in going above the trees or anywhere he chose; but perhaps wisdom would dictate he should have still more experience a little nearer the ground. The machine easily made thirty or forty miles an hour, and this in going only a little more than half a mile straight ahead. No doubt it would get up a greater speed if allowed to do so—perhaps, with the wind, a mile a minute after the first mile. The manager could doubtless go outside of the field and bring it back safely, to be put in the little house where it is kept nights. But no matter how much time it takes, I am sure all the world will commend the policy so far pursued—go slowly and carefully, and avoid any risk that might cause the loss of a human life. This great progressive world can not afford to take the risk of losing the life of either of these two men.*

I have suggested before, friends, that the time may be near at hand when we shall not need to fuss with good roads nor railway tracks, bridges, etc., at such an enormous expense. With these machines we can bid adieu to all these things. God's free air, that extends all over the earth, and perhaps miles above us, is our training field. Rubber tires, and the price of rubber, are no longer "in it." The thousand and one parts of the automobile that go to make its construction, and to give it strength, can all be dispensed with. You can set your basket of eggs almost anywhere on the upper or lower deck, they will not even rattle unless it be when they come to alight. There are hundreds of queer things coming to light in regard to this new method of travel; and I confess it is not clear to me, even yet, how that little aluminum engine, with four paddles, does the work. I asked the question, "Boys, would that engine and these two propellers raise the machine from the ground if placed horizontally above it?"

"Certainly not, Mr. Root. They would not lift a quarter of its weight."

"Then how is it possible that it *sustains* it in the air as it is?"

The answer involves a strange point in the wonderful discovery of air navigation. When some large bird or butterfly is soaring with motionless wings, a very little power from behind will keep it moving. Well, if this motion is kept up, a very little incline of the wings will keep it from falling. A little *more* incline, and a little more push from behind, and the bird or the butterfly, or the machine created by human hands, will gradually rise in the air. I was surprised at the speed, and I was astonished at the

wonderful lifting power of this comparatively small apparatus. When I saw it pick up the fifty pounds of iron so readily I asked if I might ride in place of the iron. I received, by way of assurance, the answer that the machine would no doubt carry me easily. You see then I would have the "front seat;" and even if it is customary (or used to be in *olden* times) to accord the front seat to the ladies, I think the greater part of them would say, "Oh! sit still, Mr. Root. Do not think of getting up to give *us* your seat."

At first there was considerable trouble about getting the machine up in the air and the engine well up to speed. They did this by running along a single-rail track perhaps 200 feet long. It was also, in the early experiments, found advisable to run against the wind, because they could then have a greater time to practice in the air and not get so far away from the building where it was stored. Since they can come around to the starting-point, however, they can start with the wind even behind them; and with a strong wind *behind* it is an easy matter to make even *more* than a mile a minute. The operator takes his place lying flat on his face. This position offers less resistance to the wind. The engine is started and got up to speed. The machine is held until ready to start by a sort of trap to be sprung when all is ready; then with a tremendous flapping and snapping of the four-cylinder engine, the huge machine springs aloft. When it first turned that circle, and came near the starting-point, I was right in front it; and I said then, and I believe still, it was one of the grandest sights, if not the grandest sight, of my life. Imagine a locomotive that has left its track, and is climbing up in the air right toward you—a locomotive without any wheels, we will say, but with white wings instead, we will *further* say—a locomotive made of aluminum. Well, now, imagine this white locomotive, with wings that spread 20 feet each way, coming right toward you with a tremendous flap of its propellers, and you will have something like what I saw. The younger brother bade me move to one side for fear it might come down suddenly; but I tell you, friends, the sensation that one feels in such a crisis is something hard to describe. The attendant at one time, when the rope came off that started it, said he was shaking from head to foot as if he had a fit of ague. His shaking was uncalled for, however, for the intrepid manager succeeded in righting up his craft, and she made one of her very best flights. I may add, however, that the apparatus is secured by patents, both in this and in foreign countries; and as nobody else has as yet succeeded in doing any thing like what they have done I hope no millionaire or syndicate will try to rob them of the invention or laurels they have so fairly and honestly earned.

When Columbus discovered America he did not know what the outcome would be, and no one at that time knew; and I doubt

*If these two men should be taken away by accident or otherwise, there is probably no one living who could manage the machine. With these men to teach them "the trade" however, there are plenty who could doubtless learn it in a few weeks.

if the wildest enthusiast caught a glimpse of what really did come from his discovery. In a like manner these two brothers have probably not even a faint glimpse of what their discovery is going to bring to the children of men. No one living can give a guess of what is coming along this line, much better than any one living could conjecture the final outcome of Columbus' experiment when he pushed off through the trackless waters. Possibly we may be able to fly over the north pole, even if we should not succeed in tacking the "stars and stripes" to its uppermost end.

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