Rufus Porter and His "Flying Ship"

By C. E. McCLUER

SOON after the Montgolfiers invented their first "hot-air" balloon, which was almost immediately followed by the first "gas" balloon, the attention of scientists and inventors seems to have been centered on the spherical and elongated gas bag as a means of flotation, and the provision of propellers and rudders to enable the navigator to control the movements of the unwieldy and wind-tossed sphere, and produce what is now known and briefly described as a "dirigible" balloon. Omitting all reference to the work of the many accomplished and venturesome balloonists who originated or copied the various devices which they adopted for the guidance and management of their spherical or pear-shaped or elongated and cigar-shaped gas envelopes, we will revert at once to the subject of our sketch.

Rufus Porter, belonging to that numerous class of ingenious New Englanders usually styled "Yankee inventors," was born at West Boxford, Mass., May 1st, 1792, and died in New Haven, Conn., August 13th, 1884. Although he received only a common district school education, he possessed an alert mind and a retentive memory, which, coupled with a natural genius for observation and invention, fitted him admirably for an active and useful life. He early displayed inventive abilities of no mean order, as is attested by the list of his patented inventions disclosed by the records of the Patent Office. Some of his patents displayed an acumen and foresight which led him into the van of progress, and proved that he was fully abreast if not actually ahead of his time. Among his numerous patented inventions we find enumerated a cord-making machine, a steam carriage or ordinary road vehicle, prophetic of latter day automobile, a pioneer treadmill horse power machine, a corn sheller, the inevitable Yankee churn, a washing machine, a signal telegraph, and a municipal fire-alarm system, the latter doubtless being the forerunner of the largely adopted and efficient Gamewell fire-alarm system, now so largely in vogue.

In 1840 we find Porter as editor of The New York Mechanic, the first purely scientific newspaper published in the United States. The next year it was removed to Boston, and the title changed to The American Mechanic. In 1845, evidently not having made a pronounced success with the publication of The American Mechanic, he returned to New York and began the publication of another journal, which he styled "Scientific American, the Advocate of Industry and Enterprise, and Journal of Mechanical and Other Improvements," on a cash capital of $100. The first number of the new periodical was issued on the 28th day of August, 1845. After six months of struggle, with varying success, his journalistic enterprise was purchased by the present proprietors of the Scientific American.

Among Porter's less noticed inventions, and the one from which I presume he reaped the smallest recompense, was a flying machine, or as now styled, a "dirigible" balloon, but which he dubbed an "aeroport." As nearly as I can ascertain from the records at my command, this invention was made and patented in 1820, but not until 1852 did Porter seem to make any serious effort to exploit the device. In that year he organized what he called "The Aerial Navigation Company," and attempted to raise the funds necessary to enable him to construct his first aeroport by an appeal to popular support through the sale of $5 bonds or certificates.

Among the papers of my deceased father I have recently found one of these bonds, issued to him under date of April 29th, 1852.

below follows an abbreviated copy of the "proposition and prospectus" alluded to in the bond, as I find it printed in the issue of the National Intelligencer of March 19th, 1852.

"The Flying Ship"

"A chance to secure a cash income of $10 to $20 per week for twenty years by the investment of five dollars in advance.

"It is extensively known that the undersigned has by theory and practical experiments so fully demonstrated the practicability of aerial navigation that all who have fully examined the subject are convinced; and no person, even of those whose interests are adverse to its success, can offer a word of rational argument against it. Several model machines have been constructed, and each of them has operated successfully; and one of them, sixteen feet long, carried a small steam engine, by the power of which the machine was propelled; and, being guided by its own helm, travelled through the air, even against a breeze of wind, in direct lines or circles, according to the adjustment of its helm. This machine was witnessed and applauded by hundreds in New York and Boston, and notices thereof were published in several newspapers of those cities at the time. Since those experiments were made the inventor has made additional improvements whereby the invention is now perfected. And it appears certain that a safe and durable aerial ship (or aeroport), capable of carrying one hundred and fifty passengers at a speed of ninety miles an hour, with more perfect safety than either steamboat or railroad cars, may be constructed for $15,000, and that the expense of running it will not exceed $25 per day. It is ascertained by a minute and careful estimate that an aeroport 150 feet long and capable of carrying five persons at a speed of sixty miles an hour, may be constructed for $1,500. Now, having been disappointed of the funds requisite to put this invention on a scale of practical utility, I propose that if three hundred persons will subscribe five dollars each, payable when the whole amount of 1,500 dollars shall have been subscribed, I will forthwith construct this pioneer aeroport (which may be done in six weeks); and when this is put in operation I can readily command the requisite funds for constructing a large aeroport as above mentioned. And I will so arrange that each subscriber on the payment of five dollars, shall be furnished with a regular title deed, which shall entitle the holder thereof to one three-hundredth part of this first aeroport, and also to one three-thousandth part of the first large aeroport that shall be constructed, and of all benefits and emoluments that may be derived therefrom for twenty years; the said aeroport to be kept in repair without expense to the shareholders. . . . Washington, March 16th, 1852. Rufus Porter."

While with the added knowledge and experience of a half century we can see wherein Porter was mistaken in his calculations and visionary to a considerable degree, we can also see wherein he was in advance of his day and generation, and prepared to achieve the success that later and quite recently attended the efforts of Count Zeppelin and others of the present day, had he but been in possession of the gasoline or alcohol motor as now applied to dirigible balloons and aeroplanes. Comparing the fanciful representation of his aeroport as given by the engraving

Six Boys and a Blaze—Pleasant Feature of a Snowshoe Tramp

printed on the bond, one cannot help being struck with its resemblance to the modern dirigible balloon. While, without repeating Porter's calculations as to the capacity of his aeroport for tonnage and speed, I judge he was guilty of exaggeration, he certainly came mighty near the ideal conditions for a successful dirigible balloon with weight of engine, boiler, and cabin greatly reduced. What method he adopted for stiffening his gas cylinder in the absence of the metal aluminium, as used by Count Zeppelin, is not disclosed, but it is quite possible an inspection of his patent might disclose some adequate provision for that purpose.

Rufus Porter is certainly entitled to all the credit attaching to the organization of his "airship" enterprise, and the exercise of his superior inventive faculties in conenction with the science of aeronautics and as a pioneer in that department of human endeavor.

LIMITS OF THE MICROSCOPE

IMPERFECTIONS of the microscope which have not yet been wholly overcome make its effective use impossible for magnitudes below a well-defined limit. This has been greatly lowered of late, but be are told that its permanent location has now been reached. Says Maurice Leblanc, writing in La Nature (Paris):

"Theoretically we may obtain with a microscope a magnification as great as desired . . . and with the recent improvements of Chabrie we may have enlargements of 5,000 to 6,000 diameters.

"Unfortunately what we want in magnifying an object is to distinguish its smallest details; it is of no value to be able to see merely a blotch of color . . . Thus, a microscope's practical value depends not so much on its enlargement as its ability to give clearly separated images of two adjacent parts of the object; this is called its separating power. . . .

"Experiments show that with the best microscopes we can not distinguish points whose distance apart is less that 1-5000 milimeter; and yet enlargements of 5,000 to 6,000 diameters ought to enable us to see objects separated only by 1-50000 milimeter. This inconsistency arises from the fact that we have hitherto supposed that the image of a point in the microscope is itself a point, whereas, no matter how well corrected the instrument may be, this image, because of diffraction, is a tiny circle. To two adjacent points in the object correspond in the image two adjacent circles; and these can not be distinguished when the circumference of one passes through the centre of the other. It then becomes useless to increase the magnifying power, for the diameter of each circle augments proportionally to the distance of their centres. The diameter does not depend on the construction of the microscope; it diminishes with the wave-length of the color that lights the object and increases with the refractive index of the substance that separates the object from the object-lens of the microscope and also with the angle subtended by the diameter of the object-lens as seen from the object.

"To increase this separating power, therefore, the following artifices are employed: the object is illuminated with green, or even with ultra-violet light. As the latter is invisible, a fluorescent eyepiece is necessary to see the image, or photography may be employed. Objects that may seem with ultra-violet light are much smaller than those that may be studied with the visible rays, in the ratio of 56 to 100.

"Besides, there may be introduced between the object and the object-glass a drop of cedar oil, whose refractive index is considerable, and finally . . . the frontal lens of the objective is given a very convex form. . . . With all these devices the limit of 1-6000 millimeter may be reached."

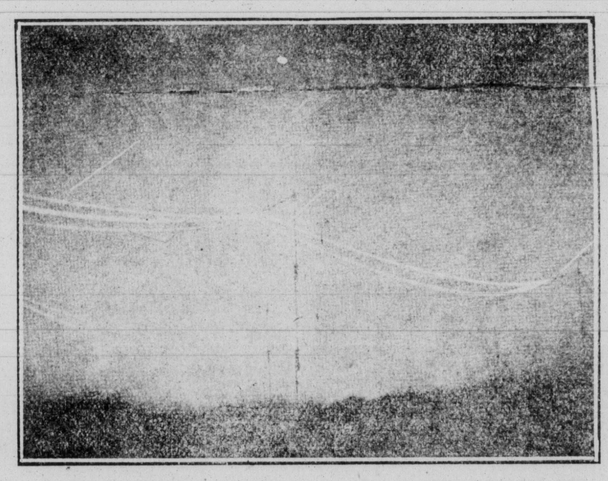
Here we meet with an obstacle dependent on the very nature of light, before which the skill of our opticians is powerless. Must we then give up trying to go further than this in our knowledge of the infinitely small? Says the writer:

"The eye can not distinguish the form of an object whose angular magnitude is less than 1 deg. but an object even when not brightly lighted, is visible when its angular size is 30 deg., and very brilliant luminous points are still clearly seen at a minimum size that depends only on the intensity of their visible radiation; it is thus that we see the stars, despite their infinitesimal apparent diameters. They do not form images on our retina, they are not visible in the sense that larger bodies are so, but we appreciate their existence because the light that is given out by them and that penetrates into the eye, is sufficient to produce sensible optical excitation

"It is difficult to find objects which, like the stars, are self-luminous, but if small bodies be brilliantly illuminated, they give out light in all directions and act just like luminous points; this is how we see the dust in the path of a sunbeam. . . .

"Siedentopf and Zsigmondy, and afterward Cotton and Mouton, have built apparatus in which the preparation placed under the microscope vertically is brilliantly lighted horizontally. These ultra-microscopes, as they are called, enable the user to see objects whose diameter is about 1-150000 millimeter, or about ten times the mean diameter of a molecule.

"These recent processes have enabled us to determine the structure of the colloidal (or gluey) substances which play so important a part in vital processes. We know also that the microscope has been powerless to reveal the germs of certain diseases. We understand now that this is in some cases because they are too small. They have been seen with the ultra-microscope and the introduction of these new methods into bacteriology is therefore most hopeful."



FIRST PHOTOGRAPH EVER TAKEN OF A WIRELESS MESSAGE

The Receiving and Transmitting Wires are Here Shown Electrified. The Three Straight Bars are Actually Electric Waves Leaving the Electrified Wires. All This is Invisible to the Naked Eye But is Caught by the Camera.

HOW CANADA STARTED THE MARATHON CRAZE

(By William Hemmingway)

HOW many Americans know where our present craze for long-distance running originated? The entire continent is suffering an epidemic of Marathonitis in its most violent form. One cannot stroll in any big pleasure ground between Central Park, New York, and Golden Gate Park in San Francisco, without seeing scores of youths, head up and elbows in, plodding along at the regular monotonous, jog trot which tells that they are training for the classic course of twenty-six miles, three hundred and sixty-five yards. The country roads are full of candidates in the throes of preparation. No athletic meeting is complete without a Marathon event.

And where did it all begin? Neither in Greece, where the original Marathon course still invites the fleet of foot, nor in England, where the sport of cross country running has flourished for centuries, nor in the United States, where new inventions are born every minute. Canada is the birthplace of Marathonitis, and Hamilton is the city of its origin. The history of the game sounds like a legend, but it can be verified with ease. To begin at the beginning, R. B. Harris, one of the proprietors of the Hamilton Herald, was a great athlete in the early nineties. Canada is a sort of northern blue-grass country, noted for its fine women, fine horses, fine whisky, and enthusiastic sportsmen. And one of the chief among these was Mr. Harris. If you look at a map of Lake Ontario you will find the city of Hamilton perched beside a long bay at the very tip of the lake. Some six or seven miles east of its head the bay is almost cut off from the lake by a long, low sand bar, which is pierced by two canals. One can start from the city of Hamilton on a good, though hilly, road running westward, double around the head of the bay, turn eastward and come back across the sandy peninsula toward the starting-point. The country is beautiful, the air bracing, the going diversified, and the distance around the circuit exactly nineteen miles, one hundred and sixty-eight yards.

Among the many lovers of outdoor sports in Hamilton about 1890 were a dozen or more young men who used to walk around the bay on winter Sundays when golf and rowing and sailing were impossible. They took their doges with them, lingered an hour or so at a tavern for luncheon, and made a jolly day of it. Inevitably the spirit of competition seized upon them. The course was surveyed, and the party began to try to nip off a little of the time consumed in walking the distance. Please remember that during all this period the 80,000,000 Americans and the 6,000,000 Canadian neighbors of the walkers had no idea that the germ of Marathonitis was flourishing in their midst. Neither had our party of all-day walkers. They began presently to do the entire distance without stopping, and cut the time well down within four hours. Then R. B. Harris, having for weeks abstained from rich foods, alcohol and tobacco, and having trained faithfully for the event, set forth one day in pursuit of the record. He covered the distance at a fair heel-and-toe walk in a little more than three hours, which was going some for the last decade of the nineteenth century. Other walkers of the coterie also trained for the event and made mighty assaults upon the record, but, try as they would, R. B. Harris still proved himself the best man.

Out of this grew another event, or, rather, a further development of the same idea. R. B. Harris thought the newspaper ought to make the race popular by advertising it.

"The Herald will give a big silver cup for a go as-you-please race around the bay," said J. M. Harris, elder brother of the champion.

"Fine scheme!" cried R. B., and "Fine scheme!" echoed all the other enthusiasts. The prize was exhibited at the show-window of the newspaper, and on Christmas Day, 1894, a dozen hardy athletes—aged men of thirty or so—started on the long journey for its possession. Then and there was ripened the germ of Marathonitis, which by this time has attacked hundreds of thousands of husky Canadians and Americans. A crowd, but not a large crowd, turned out to see the start, and not many more were present at the finish. The road was covered with snow and slush, and it was practically impossible for any one to follow the contestants in vehicles around the course. Our friend and champion, R. B. Harris, took the lead at the start, setting the pace with a fine, swinging, heel-and-toe stride which was the perfection of grace, good form, etc. He led all the way out of town. When the pack, still well bunched, swept out into the open country, W. R. Marshall felt that his heart action had been sufficiently accelerated by the brisk walk and began to run at a steady six-minute clip. Of course, he began to draw away from the leader, Harris.

"Here, here! old boy; that won't do!" cried Mr. Harris, as Mr. Marshall ran away. "This is a go-as-you-please race, you know."

"Of course it is," Marshall replied, as he jogged away. "It's go-as-you-please, and I please to run. Good-by, old man."

Snowshoers on Tramp—These Are All Hollys

And good-by it was, too, for none of the others could run half so well as Mr. Marshall. Not that he would play a prominent part in a Marathon race of today. Far from it. The game has improved so much that he would be lucky in these times if he should finish in the first half-dozen. Indeed, the tactics he used would be of no avail today; for his competitors declare that he had recourse to a very primitive plan. After saying good-by to leader Harris he ran as fast as he could, and then sat down upon a rock conveniently low—as the walrus and the carpenter did on a well-known occasion.

When Mr. Marshall saw his competitors approaching he arose and ran on again for a few miles, until he again felt weary and again rested. At times he walked, too; so that by judicious alternation of running, walking, and resting he maintained his lead and finally won by a comfortable margin. It would seem invidious to mention here the time Mr. Marshall made. He is a good sportsman, and it is enough to say that he did better than two hours and a half. The long, lean lads of today make the journey in one hour and fifty-five minutes.

In the next year Labor Day was chosen for the event, but this was as much too hot as the preceding Christmas was too cold, and with the thermometer marking ninety degrees in the shade the runners were fatigued. So in 1896 the run was made on Canadian Thanksgiving Day, which falls early in November, and on that day it has been held ever since. It is worthy of note that the famous Boston Marathon race was not started until four years after the Hamilton event.

But let us trace the history of the Canadian sport a little further. When William Sherring, a product of Hamilton training, surprised the wise men by winning the Marathon race in the Olympic games at Athens, in 1906, he beat the best distance-runners of Greece, England, Ireland, Italy, and all the rest of the world. He had accumulated valuable experience in the nineteen-mile road race at Hamilton, but he had never won it, and nobody thought of him as a championship possibility. He went to Athens with a light purse and very little baggage, and he not only trained himself and did his own rubbing down, but had to take care of himself on the long, dusty, and heart-breaking journey from Marathon to the Stadium at Athens. Sherring left Hamilton in obscurity, but returned a hero. The Canadians gave him a purse of $6,000, a house and grounds and employment for life.

Sherring's victory exploded the theory which had been long entertained by American athletes—that only in the moist climate of England, mild all the year round, could the best long-distance runners be produced. Marathon races began to be featured at many of the Canadian and American athletic meetings. Hamilton produced Jack Caffery, Dennis Bennett, and other champions. There is hardly a club in either country today that has not a team of Marathon candidates, and, if the present craze continues, it is not rash to predict that the Marathon race at the next Olympic games will be won by a North American.

CAT'S SENSE OF DIRECTION

A KITTEN about six months old was taken to a house a few miles distant from its birthplace, confined in a room and tenderly cared for during a week, and then set at liberty. It was supposed to have become habituated to its new surroundings, but it returned to its old home on the day of its release. The sense of locality and direction was exhibited still more strikingly by an old tom cat, which was stolen and carried a distance of twenty miles, confined in a bag. The cat was imprisoned, but made its escape and in a few days reappeared in a pitiable state at the home of its former master, which was separated from that of the thief by a high wooded cliff.

WOVEN ALUMINIUM

ALUMINIUM, as is well known, is extracted from clay, and it was Napoleon who styled it the "silver of clay." Formerly, it was the practice to extract it from the clay with the aid of retorts. More recently, the electrical current is employed for this purpose with marked success, the cost of producing this valuable and by no means fully utilized metal, having by its employment been very much reduced. In 1850, a pound of aluminium cost about $40; nowadays it costs only about twenty cents. Above all other metals, aluminium has the greatest specific lightness with the greatest durability and toughness. It can be rolled, cut and drawn exceedingly fine. This has made aluminium valuable and useful in the textile industries. For many years, woven sieves or screens have been made of aluminium, which have proved indispensable in the sugar refining industry. Its principal advantage consists in the fact that the surface of the aluminium, on the slightest exposure to the air, becomes covered with a coating of oxide which is capable of offering almost perfect resistance to foreign influences, such as acids, etc. This is likewise of great importance where aluminium is used in the textile industries.

Speaking of actual weaving of aluminium into special fabrics, particularly such as are intended for use for decorative purposes and costumes, it may be stated that this is well and successfully practised in England. At the time of the Paris exhibition, there were shown, as special attractions, fabrics and clothes made from glass fibres. They were made from finely spun glass, with silk. The fabrics made from aluminium do not need combination with other textile yarns. Of late, the most beautiful effects have been obtained by employing aluminium in smooth as well as twisted threads for the warp, and as the weft, silk yarn of any desired color. They are used for evening cloaks and theatrical costumes. As the Textil-Woche says, it makes the body of a beautiful woman look as though dipped in silver. From aluminium they are now making neck-cloths, pompadours, shoes, belts, neckties, shawls and hats, and it is hard to prescribe a limit for the possibilities of this metal. Very striking are net fabrics in combination with aluminium, which constitutes a select novelty for interior decoration. Aluminium yarn, made up into laces for ladies' shoes, as well as used for straps, promises to be a feature of the coming season.

TRANSMIGRATION

This transmigration is a bore
As near as I can see;
A feller dies an' comes right back
To be a chimpanzee.

They say a feller never knows
Jist what'll come t' pass;
He's likely t' infest a whale,
Er mebbe some jackass.

An' yit, I reckon, if it's fate,
I'd better make no fuss;
Fer mebbe if I'm good I'll come
An' be an octopus.
But I was too fly!

REST FOR THE WEARY

THE Business Man's always so Terribly Tired,
He wouldn't see Shakespeare unless he were hired;
And Fitch and Hank Ibsen are under the ban.
So we'll fix a show for the T. Business Man.

The scenery: First comes the Cannibal Isle,
With monarch in blackface and chorus in smile;
Then Broadway at Midnight, and June in Japan—
(It's bound to go great with the T. Business Man.)

For songs: Seventeen of those lyrical flights,
Which best are expressed by a whirlwind of tights;
The rhymes will be awful, the metres won't scan,
Except in the brain of the T. Business Man.

As by-play we'll knock someone down with a bat,
Or kick him (Right Centre), there's humor in that;
A slam in the tummy is funnier than
A garrulous jest to the T. Business Man.

The plot: Hoity-Toity, and likewise
What Rot!
How dare you suggest such a thing as a plot!
To putter with plots we should have to trepan
The oaken-bound head of the T. Business Man.

So bring up the slapsticks and bring up a van,
Of curvulous broilers (see poster for plan)—
A song that's salacious! A catching cancan—
And we'll sell out the house to the T. Business Man!

A GARDEN AND A ZOO

I PLANTED Pennyroyal close beside the garden fence;
It bloomed with nickels, dimes, and even silver fifty-cents.
As many people think its odor rather strong and rank,
I gathered each one as it came and placed it in the bank.

I planted Dogwood after that, and on each Dogwood tree
There blossomed little puppies just as cunning as could be.
Their bark would sound for miles around, but dogs must have their day.
Although I grieve to state that many people ran away.

But when Pussy Willows bloomed, and kitties mewed and purred,
The garden grew so noisy that it really seemed absurd.
So I decided quickly on the one thing I could do,
My plans I'd lay for beasts of prey, and turn it to a Zoo.

I planted Dandy Lions, but believe me, when they came
They never growled a little bit, but acted rather tame.
The striped Tiger Lilies that I thought would howl and roar,
Grew meekly near Horse Chestnut trees behind the kitchen door.

'Twas a very funny garden and a funny Zoo, I grant,
For the only thing that paid me
Was the Pennyroyal plant.

—Irene Elliott Benson.