

"I don't care!" I said, "I'll bring Bill Macey out, if I die for it!"

"Then you'll have to go down to the graveyard to do it," she said sarcastically, "for he's been there for the last three years!"

And with another crack, a shudder, and a forward plunge, the framework house fell, and vanished beneath the foaming flood.

I don't think life will ever hold a much better moment for me than when I put May's baby girl into her outstretched arms. May knew me at once—and could only cry, "Oh, Jack, Jack! and I thought you were dead!"

Yes, and so did everybody, and so I should have been if her husband's kind intentions had been carried

out; but that's a story she don't know, and never will know, either.

Well, happiness is worth waiting for, they say. I only know when I held May close against me once more, and felt her warm breath upon my cheek, that all the past six years seemed as nothing, and I think I'd have lived them all over again for that minute.

That was more than a year ago. Yes, that's my house, that new big one away up the valley; not far off where the other stood, but on a little higher ground, you bet! That's my wife, bless her, standing in the doorway with the little girl clinging to her skirts—that's my friend of the woods—and that little white bundle asleep on her mother's arm, is the brother she is already proudly teaching to say "Daddy!"

## TRAVELS IN THE AIR.

BY KARL BLIND.



"IT SHOT UP WITH THE VELOCITY OF A CANNON-BALL" (P. 285).

IN spite of the fatal termination of the four hundred and sixty-ninth aërial voyage of Mr. Simmonds, it would be a great mistake to lose heart as to the future of ballooning science. The mere fact of so many Icarian flights having been achieved by him successfully goes far to sustain our hopes. The question of the navigability, or guidability, of air-ships is, I truly believe, only a question of time. Some of the best scientists on the Continent certainly do not despair of the final solution of the problem, difficult as it may appear to-day.

Among those in this country who are entitled to speak with no mean authority, Sir Frederick Bramwell strongly inclines to the conviction of the ultimate realisation of this dream of ages. As President of the British Association, at Bath, he expressed himself very hopefully indeed. There he referred to "the poetical feeling which would be excited in

the breast of that engineer who would, *in the near future*, solve the problem—and it certainly *would* be solved when a sufficiently light motor was obtained—of travelling in the air, whether this solution were effected by enabling the self-suspended balloon to be propelled and directed, or, perhaps better still, by enabling not only the propulsion to be effected and the direction to be controlled, but by enabling the suspension in the air itself to be attained, by mechanical means."

Though guidability proper—*Lenkbarkeit der Luftschiffe*, as the Germans call it—is still in the crude stage of experiment, a way of tacking and moving along, by means of alternately rising and sinking through different cross-currents of air, has been indicated and practised by a French friend, a well-known aëronaut and distinguished scientific writer, M. Wilfrid de Fonvielle, with at least a degree of success. Many have been his aërial voyages and perils. His volume, entitled "La Science en Ballon," is as valuable in the way of learning as it is characterised by that poetical feeling of which Sir Frederick Bramwell speaks. Years ago I had the pleasure of being up with Fonvielle, from London, in the famous giant captive balloon, in which Mr. Glaisher, the eminent meteorologist, had the direction, and in which Messrs. Godard, Yon, Mangin, Chavantier, Tissandier, and other well-known aëronauts, who had brought it over, occupied places in the car. This immense balloon, the volume of which was no less than 424,000 cubic feet, and its height 121 feet, was located in a circular enclosure extending to the height of a five-storied house. The cable was 2,132 feet long, and weighed 59 cwt.

The ascent was made during a great storm. So tempestuous was the weather that Mr. Glaisher at first thought the enterprise should be given up on that day. Finally, it was decided that the attempt should be made, and I confess I was right glad of it. We had a glorious spectacle before us

over the Thames, though we were bumped about so badly, and at such suddenly changing and precipitous angles, that one of the party was seized with that insane kind of giddiness which all at once gave him an irresistible impulse to throw himself out of the car. Fortunately he was quickly held back by those near him. My first notion was, when seeing his jerky movement, that he had become sea-sick in the "Air-Ocean," as the Greeks called the earth's atmosphere. Being near him, I therefore covered my face with my Inverness cape, lest what I imagined was his preaching to the birds should reach me through the gusty wind. A moment afterwards, however, I felt hands pulling him down, whereupon he sank sideways on his knees, so that his vision might be shut in as by blinkers.

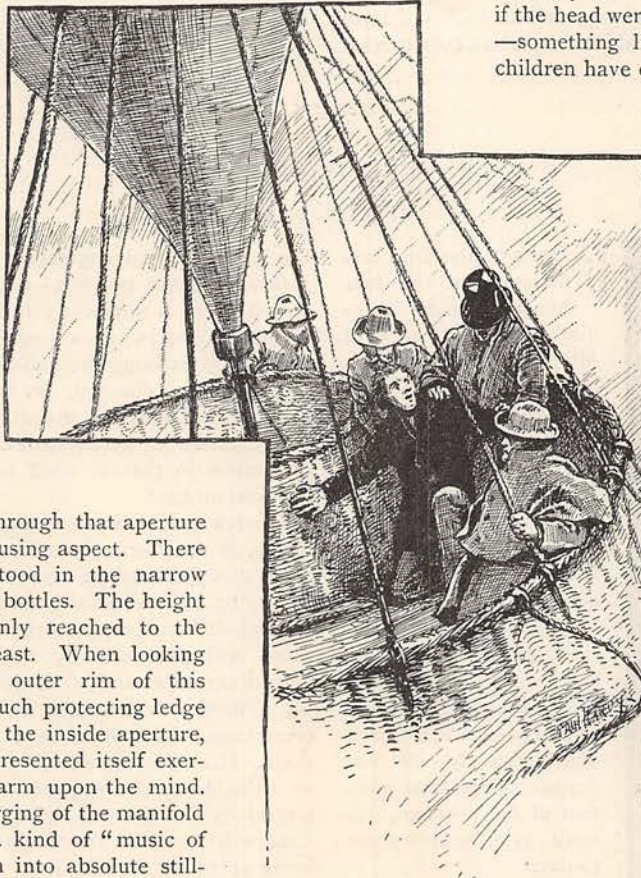
Properly speaking, the car was a mere ring-shaped wicker basket, hollowed out in the middle. The landscape below could be seen through that aperture in its shifting, eye-confusing aspect. There were no seats. We stood in the narrow enclosure like so many bottles. The height of the car, or ring, only reached to the lower part of one's breast. When looking earthwards from the outer rim of this basket, which had no such protecting ledge as there was towards the inside aperture, the panorama which presented itself exercised a wonderful charm upon the mind. So did the gradual merging of the manifold sounds beneath into a kind of "music of the spheres," and then into absolute stillness, as we rose higher and higher.

"The strong wind," it is said in the work edited by Mr. Glaisher, "blew at the rate of sixty miles an hour. It whistled through the ropes—the balloon lay over, and the car oscillated violently. We were blown about 660 feet beyond the boundary of the enclosure below. . . . The sky presented an admirable aspect. The sun appeared in the midst of mountains of cloud, and its brilliant rays transformed the Thames into a river of fire. Houses, trees, and streets appeared no larger than children's toys, and the general aspect of things was the same as we experience in ordinary balloon ascents. In some of our aerial excursions we have risen to a height of 9,843 feet, and the landscape seen from this altitude is not more striking than from the car of the captive balloon."

Mr. Glaisher seemed to pay no attention to the force of the wind, or to the jerky oscillations of the air-ship. His eyes remained fixed either upon his instruments or the dynamometer, which indicated a tension of three tons. However, at last, the danger signal was hung out, and we were wound back—not without much risk of striking against the stockade, and thus coming to grief. The French working men below anxiously and noisily discussed this possibility. For all that, we had greatly enjoyed the trip. But the coming down, frankly to avow, was the hideous part of it. It was effected in such short but violent pushes that I felt repeatedly as if the head were thrust into the stomach—something like the cruel way some children have of driving a beetle's head

into its body. We all landed, in consequence of this unpleasant descent, rather greenish in the face.

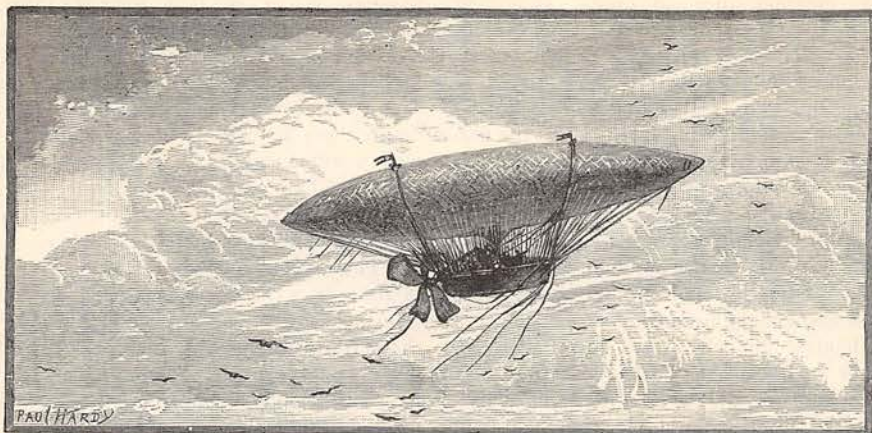
The balloon in question was the same as that in which afterwards a meteorological investigation, with the aid of electrical light, was to be made at night. Only the Duke of Sutherland and three others—I myself and my son again among them—had this time accepted the invitation to a "seat," or standing-place, in the car. Ledru-Rollin and Louis Blanc had politely and thankfully declined already in the first



"FORTUNATELY HE WAS QUICKLY HELD BACK."

instance, when asked by Wilfrid Fonville. Mr. Yon, the director of the balloon, it is true, himself afterwards refused to allow of our joining in the proposed nocturnal venture, as he considered it altogether too dangerous. Still, I entertained a hope that this impediment would finally be removed, and therefore hastened to return from a lecturing tour in North England so as to be yet in time. The first news I heard at Euston Square was:—"The balloon has broken loose!"

In fact, shortly before the ascent at night was intended to be made, the air-ship escaped from its cable. Rising to an immense height—probably some 12,000



"A CLUMSY CIGAR-SHAPED BALLOON" (p. 287).

feet—it at last collapsed, and fell down in Buckinghamshire. Had it broken away from its moorings after the beginning of the proposed second ascent, those in the car would have been stifled in a moment, for it shot up with the velocity of a cannon-ball. A shred of the skin of that unfortunate balloon is still in my possession, as a memento which was near becoming a memento of death.

The French *aéronaut* alluded to, Wilfrid de Fonvielle, is a man who has displayed heroism also in fighting for freedom and in undergoing prison and exile. As much distinguished by courage as by frankness of character, he in no way undervalues the difficulties, or what seem to be impossibilities, in regard to the steering of balloons, but is equally persistent in efforts towards overcoming them. His view as to the merely accidental cause of Mr. Simmonds' misfortune is no doubt the correct one. Altogether, Frenchmen have for years been in the vanguard of the *aéronautical* movement. The Government of Paris, with an eye to strategic purposes, has given its pecuniary aid to it with no stinting hand: at least, when we compare its action with that of the Governments of other countries.

Gambetta, it will be remembered, left besieged Paris, in 1870, by the *aërial* way. So did Fonvielle later on, as the bearer of a message. At that time he came over to England, trying to enlist the sympathy of this country in favour of France, whose attack upon Germany, to his honour be it said, he had, in the beginning, disapproved of and condemned. But though the views he afterwards held, in the autumn of 1870, could not possibly be mine, and though I had to tell him so in presence of the Positivist leader with whom he came to my house, I have never ceased following with interest his scientific labours, or keeping up with him relations in matters concerning the peaceful progress of France—so often, unfortunately, threatened by would-be Dictators.

The Germans, in 1870-71, were still far behind the French as regards *aërial* locomotion; but they have been busy for many years past with improving themselves in it. Plans for the navigability of air-ships have been frequently elaborated, of late years, at Vienna and Berlin, as well as at Paris and in this country. For the practical result we have yet to wait; but it will come in due time. There is a "Society of German *Aëronauts*" now—formed, I may



THROWING PIGEONS FROM A BALLOON (p. 287).

be allowed to mention, after an urgent appeal to that effect had been published in the chief Berlin journal (the *Vossische Zeitung*) by the present writer. The name adopted by the Society is the one suggested by him; and he was glad to comply with the request addressed to him from Berlin to be the medium of its first communications with the English "Balloon Society." Though only an outside observer as regards the scientific principles involved in the question of aerial navigation, I have always felt that the forthcoming solution of the problem will not only effect a great revolution in the means of communication, but also a vast change in warfare.

If the mechanical difficulty is once overcome, we shall no longer be astonished at the description of an ancient Hindoo ruler descending from his cloud-car, as we read in that beautiful old Indian drama, *Sakuntala*, or "The Story of the Golden Ring." Skid-bladnir, the "Winged Vessel of Wood," on which Freyr, the Norse sun-god, rode, when he did not use his boar Gullinbursti (Golden-bristle, *i.e.*, the sun), will have become a reality with the invention in question. In the Edda, the Teutonic Scripture, Skid-bladnir is described as a remarkably good ship, so large that all the gods had place on board with their weapons, and always in possession of a fair wind as soon as its sails were set, whithersoever this celestial air-ship was steered. After having been used, Skid-bladnir "could be folded together like a piece of cloth," and carried in a pocket—that is, in such a capacious or magic pocket as heavenly rulers may be expected to have.

Myths apart, it is not too much to say that, at least in some of these old poetical descriptions, there are

manifest traces, or dim remembrances, of a lost science or attempted solution of a scientific problem. The tale of Daidalos and Ikaros clearly refers to aeronautical attempts in pre-historic Greece.

But to return to sober science. On matters aeronautic there has latterly been published a new treatise well worth being read and pondered upon. It is entitled "The Navigable Balloon in War and Peace," by General W. N. Hutchinson (Eastbourne, 1888). The aged and experienced writer there says:—

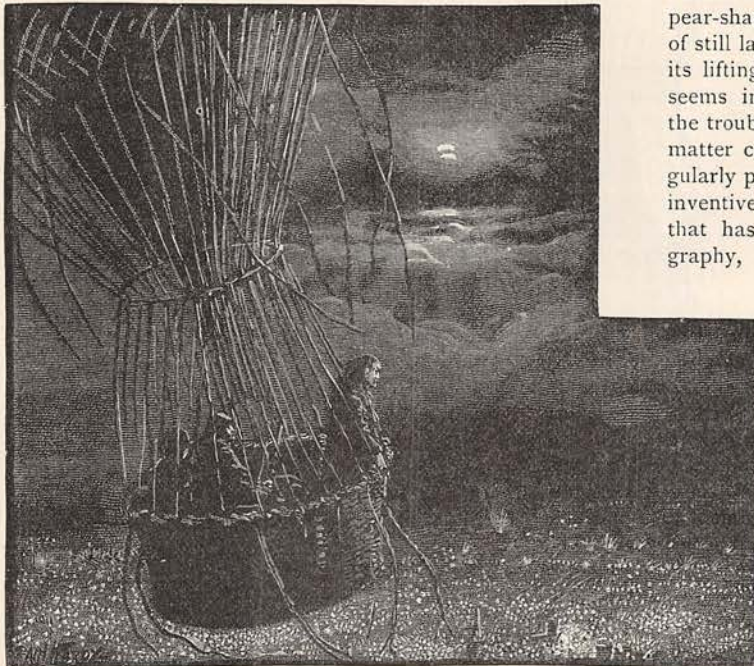
"That ballooning science is in its infancy, is one of those trite commonplaces which run glibly enough from the tongues of many who know nothing of either the performances or the promise of the infant science. That valuable useful observations in high altitudes have been made by means of free balloons, and that captive balloons are of immense service in moderate weather in spying out an enemy's strength and weakness, is the utmost the general reader will expect to be called on to credit; and it will probably be a surprise to most of those who use the aforesaid phrase to hear that *more than once a small 'Navigable' has been steered against a breeze, returning after a voyage of several miles to the original starting-point.*"

And again:—"It is undeniable that immense balloons, capable of carrying great weight, have been successfully floated—at a time, too, when no skin was procurable nearly as efficient and light as could now be manufactured. Giffard's captive balloon, seen by thousands at the Paris Exhibition in 1878, had nearly 883,000 cubic feet capacity, with accommodation for fifty-two persons, and supported a cable of sufficient weight and strength to enable it to ride safely through

a very severe storm, notwithstanding the resistance to the wind presented by the wide pear-shape; and there have been balloons of still larger capacity. With hydrogen gas, its lifting power was twenty-seven tons. It seems incredible that those who will take the trouble to reflect upon this all-important matter can continue to entertain, unless singularly prejudiced, so poor an opinion of the inventive talent of the present age—the age that has produced such marvels as telegraphy, phonography, and the wonderful

spectroscope, &c.—as to maintain that with the aid of the light, compact, economically burning steam-engines that can now be manufactured, rapid motion with guidance cannot be given to any floating passive mass, however large, on its receiving a suitable form of progress."

In developing his idea, General Hutchinson, with good reason, remarks that, from the balloon being in the air, impulsive influence



ESCAPING FROM PARIS (p. 285).

imparted to it has been too hastily compared with the flying of birds, which, by the exercise of great muscular force, have to sustain their weight while in flight. "A comparison with the movements of fish, which, like balloons, have no weight to sustain, would be more appropriate. At any depth they rise by expanding the swimming bladder, sink by contracting it—the very principle suggested for adoption in altering a balloon's altitude. On watching the graceful actions of the gold and silver inmates of a glass bowl, it will be seen that merely the gentle movement of a *small* fin effects a complete change of position. Similarly, speaking mathematically, the abstraction or addition of a pigeon changes the position of the balloon."

Here a few facts tending in the same direction may be given. It is difficult, says General Hutchinson, to realise that in an ordinary free balloon the difference of weight of only ten pounds would make such a change of altitude as 1,400 feet. Yet we have a well-known aëronaut's assurance of the fact. Mr. Simmonds, in the interesting account of his attempt, in March, 1881, to cross the Channel, tells us that when over Shakespeare's Cliff, at an elevation of 500 feet, he rose to 1,900 on throwing overboard merely that weight of fine sand. Even the trifling diminution of weight caused by the release of a pigeon slightly, yet undeniably, increases the altitude, as has been tested by scattering small shreds of paper too thin to be soon affected by gravity.

In the thrilling description given by Tissandier of his first aërial voyage, made in the *Neptune* from Calais with the aëronauts Duruof and Barret, in August, 1868, he writes:—"We were now hungry; so opening one of the boxes in the car, I took out a bottle of wine and a chicken, which we ate with a good appetite, whilst enveloped in the mist. I threw one of the bones overboard, but Duruof remarked that this was an act of imprudence, for no ballast should be thrown out without orders. I believed he was joking; but on consulting the barometer, I was bound to admit the fact upon the clearest evidence. The bone had actually caused us to rise from twenty to thirty yards, so delicately is the balloon equipoised in the air."

This, again, supports the "fish" theory of coming aërial locomotion under guidance, as indicated in the valuable treatise of General Hutchinson. After all, as before stated, even the ancients already looked upon the atmosphere surrounding this globe as an "Ocean of the Air." So the air-ships of the future may well be likened to fishes.

As to the principles of construction at present in use, no change, the author remarks, has been made since the talented engineer, M. Henri Giffard, in 1852, built and successfully steered, in a slanting direction to the wind's eye, a clumsy cigar-shaped balloon, inflated with coal-gas. But much, General Hutchinson continues, has been done since in Germany and elsewhere, and attempted in Russia. In France, the

brothers Tissandier, M. de Lôme, and recently Captain Renard, with M. Krebs, liberally assisted by their Government, have scientifically and energetically taken up the task so admirably entered upon by Giffard. In September and November, last year, Renard and Krebs made highly successful trips from Chalais Meudon in a fish-shaped balloon. "On one occasion, a nine-mile breeze blowing, they travelled at the rate of fourteen miles an hour, head to the wind, thus gaining on the wind, when it was dead ahead, at the rate of five miles an hour. After sundry evolutions to convince the most sceptical of the perfect obedience of their little vessel to its helm, *they returned to the exact spot they had quitted.* Electricity was their motive-power. Such unquestionable feats stimulated the heads of the military departments in other countries to strenuous exertions towards yet further improvements."

After having referred to experiments which are being made in Germany, that will lead, it is expected, to economically-worked steam generators being employed to propel torpedo boats, ships, railway locomotives, and navigable balloons, General Hutchinson speaks of the crowning invention of the past memorable year, due to the mechanical genius of an English clergyman, Dr. T. Jones, incumbent of Curdworth. "To his wish, last autumn, to propel by steam the tricycle on which he often rode when visiting distant parishioners, we owe what is probably the greatest invention of the present age, if it be regarded in a utilitarian point of view." At least, such was the opinion formed by most of the engineers and scientific men who witnessed the trial at the Vicarage in January last.

But the details of this, and of all other technical suggestions, those who are more deeply interested in the matter must peruse in the pages of General Hutchinson's treatise. The last news from Paris is that Commandant Renard, to whom the writer of "The Navigable Balloon in War and Peace" refers, professes to "have at last discovered a method of steering balloons." The air-ship now in course of construction at Meudon is said to be "navigable in any direction and in any weather, except when it is actually blowing a gale." Curiosity is much excited as to whether this expectation will be fulfilled.

Meanwhile we conclude by wishing the aëronautical science "good speed" under proper guidance, in the firm belief that its aim will not remain a mere poetical dream, but be realised one day like those other inventions of our age, which but a short time ago would have been considered perfect miracles, or rather, downright impossibilities. Did not Napoleon I. treat the idea of a steamboat as a sheer absurdity on which he "wanted never to be spoken to again"? On his part, Franklin, who "tore the lightning from the clouds," made the significant remark, after having been present at the first aëronautical attempt:—"This is the birth of the child!" Now we are at the point of seeing the child developing into a strong man.

