

in view of the burning of several balloons lately while up in the air. Out of seven ascents all the observations show that the positive potential decreases with increasing height, and is, therefore, apparently accumulated in the lower strata of the atmosphere. During the last four ascents Dr. Tuma was unable to find that the balloons were electrically charged.

Obituary.

M. GASTON TISSANDIER.

Gaston Tissandier, the famous balloonist and scientific writer, has just died, after a long illness, in his fifty-sixth year. The deceased aeronaut was born in Paris, and after having studied chemistry and physics with energy he took to ballooning with his brother Albert. They made nearly fifty ascents together, four being effected during the siege of Paris by the Germans. They were then attached as balloonists to the army of the Loire. In 1875 the deceased made the famous ascent in the Zenith balloon, which led to the deaths of his two companions, Croce Spinelli and Sivel. They went up a tremendous distance, 8,600 metres according to French reckoning, and Gaston Tissandier showed a marvellous resisting power on the occasion. This fatality did not check his ardour, for he soon afterwards made further ascents with his brother. They notably tried an electric navigable balloon about sixteen years since, and obtained thereby some useful results. M. Gaston Tissandier wrote many important scientific treatises in his time, and was a diligent contributor to reviews on chemical, meteorological, and aeronautic subjects. He and his brother also founded "Nature," a most useful periodical for all who are interested in the marvels of sea, sky, and land. One of his latest books was the "Martyrs of Science," and he has left behind some manuscripts which are of great scientific import and value.

Recent Publications.

"ON SOARING FLIGHT," by E. C. Huffaker, is a pamphlet published by the Smithsonian Institute. An introduction by Prof. Langley explains its contents. Of the two general

methods of flight, the first, by the direct exercise of mechanical power, in which "there is nothing, considered as a mechanical contrivance, in apparent contradiction to known principles." Whereas the second, in which "birds can fly without flapping the wings, and are able to glide over the landscape on nearly motionless pinions, has never yet been completely accounted for," and this forms the special subject of the article.

In considering the various different methods by which this might be accomplished, Prof. Langley, dismissing the palpably absurd theories of the specific gravity of the bird being much lighter than air, or that of being sustained by wind on the principle of kites, speaks of ascending currents of air, which cannot be universally present, since "what goes up must come down." Two strata of air moving at different velocities might account for the mechanical possibility. So might the many undulations and eddies which may be found in the air. Still none of these explanations seem satisfactory, and adds, "we seem, then, to have exhausted every suggestion, and yet the soaring bird still soars and remains sustained in mid-air almost without an effort."

The theory now advanced by Mr. Huffaker may be shortly described as follows. The surface of the earth absorbing a certain amount of heat from the sun, warms the strata of air immediately above it. For various reasons this warm air does not immediately rise, but hangs like a mist near the surface of the earth. When, however, any local disturbance takes place, a column of the air is able to rise through the cooler strata, a "chimney" is formed, up which the warm air can rush with a velocity sufficient to carry up small articles, such as the sand column seen in the desert, or light strands of silk, as tried by the author. The suggestion is that a large bird by flying around flapping his wings is able to form such an upward moving column of air, which, once formed, is able to carry up any soaring birds which come to that spot, and thus they are able to spirally ascend to a considerable height, and then soar away to their destination.

This theory, novel as it may be, and correct in mechanical theory, seems, however, to be a little wanting. Such ascending currents—if they exist—can but be of the lightest description, and it seems scarcely possible to believe they could be sufficiently powerful to lift a heavy bird to a great height. Even the author owns the difficulty of the problem, and adds, what is very true, "some sort of solution is