## THE RACE OF STILT WALKERS AT BORDEAUX.

Just about a year ago we gave our readers an account of a race of stiltsmen organized by the *Petite Gironde*, of Bordeaux.

This year, on Ascension Day, the same journal organized a contest which was a repetition of that of last year, adding to it this time a race of female stilt-walkers and *portanieres*.

We should not have spoken of the race of stilt walkers of this year, had not the considerations that we advanced last year been totally reversed. We said, in fact, that it was very probable that the Paris-Belfort walkers (the race was to take place in a few days) would have to do better, and show more speed than the stiltsmen, despite the concurrence of their stilts. The experiment showed that we were entirely right.

But to-day the *roles* are changed, and Aime Martin, the first stiltsman to arrive, has beaten not only the time of Ramoge, the conqueror of Paris-Belfort, at the same distance (440 kilometers), but also the foot record for twenty-four hours that belonged in this race to Duval. The latter made 159 kilometers in the first twenty-four hours, while Martin made the fine mean of 7 kilometers and 85 meters per hour.

Further, it must be remarked that Duval, exhausted by this effort, and his feet in very bad shape, almost immediately lost the first rank to arrive only the fortieth. It is, therefore, rather with Ramoge that he must be compared, and the following is a parallel that will permit of judging of the superiority of the stiltsman over the walker:

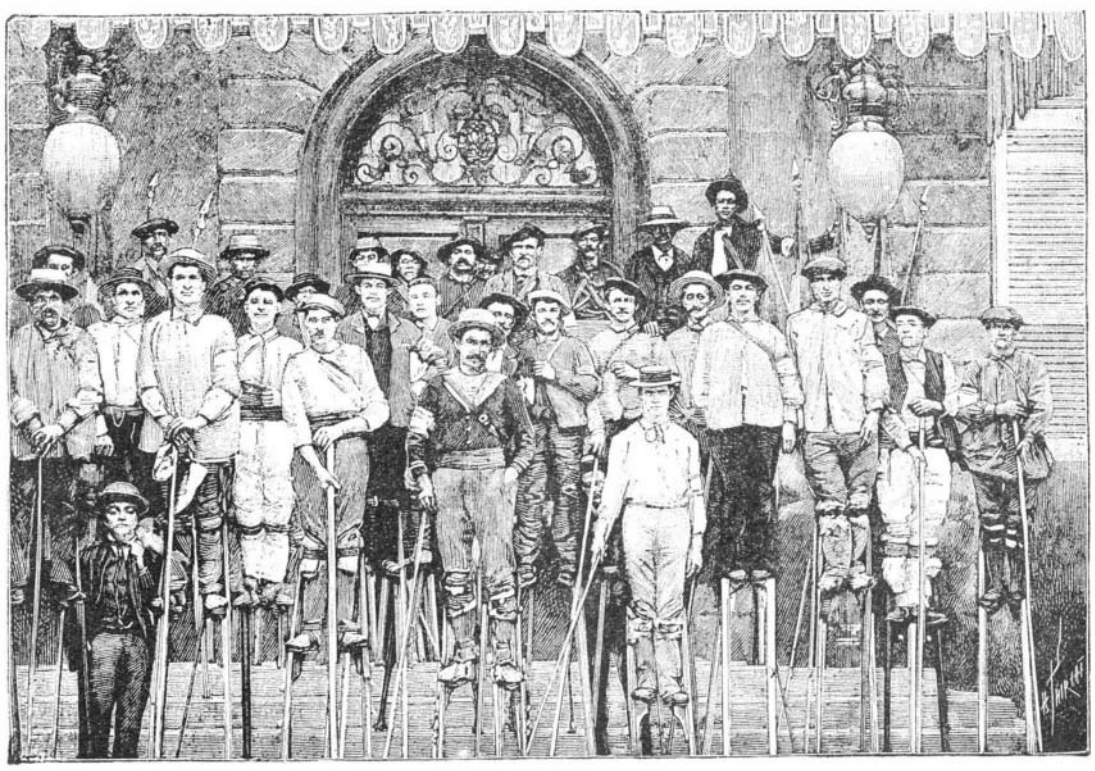
Ramoge reached Chalons-sur-Marne (161 kilometers) in 26 h. 40 m. Aime Martin reached Valence-d'Agen (170 kilometers) in 24 h. Ramoge reached Bar-le-Duc (244 kilometers) in 47 h. 36 m. Aime Martin reached Beaumont-de-Lomagne (252·5 kilometers) in 39 h. 22 m. Ramoge reached Chatenois (333 kilometers) in 64 h. 20 m. Aime Martin reached Chirac (326 kilometers) in 54 h. 50 m. Ramoge reached Mirecourt (358 kilometers) in 72 h. 20 m. Aime Martin reached Grignols (365 kilometers) in 60 h. 15 m.

It must be remarked, in the first place, in order to explain the change that has occurred since last year, that Martin had stilts of the unusual length of 1·7 meters. The mean, in fact, is scarcely more than 1·25 meters.

These long appendages, despite the great weight of four kilogrammes each, permitted him, even at the end of the race, to take steps of 1·1 meters in length. Another detail: Martin is only twenty years old, and such an age is but slightly in contradiction with the observations made upon the time of life most proper to resistance, which would be thirty years. During this long walk Martin experienced no inconvenience except a swelling of the feet, which were constantly bare upon the support of the stilts. His pulse alone exhibited great anomalies, even in comparison with that of the other runners. On the road, his pulsations were 138 per minute, and at the finish they were 120, while those of the second were but 68, and those of the third were 108.

The female stilt walkers had to make a journey of 70 kilometers, which is a long one for women. Yet the first one walked more than seven kilometers per hour.

The thing absolutely new this year was the race of the *portanieres*, which is the name in Bordeaux of women whose vocation it is to carry heavy burdens upon the head. The distance imposed was nine kilometers. Each competitor carried upon her head an osier basket, in which was placed a bag weighing twenty kilogrammes. Sixty *portanieres* took part in the race, and the first, Marguerite Pujol, thirty-six years of age, accomplished the journey, in running constantly, in the surprising time of one hour and five minutes. This last race, which took place in the presence of thirty thousand persons crowded along the way, was a genuine success, and, in conjunction with the other races of the *Petite Gironde*, shows that the human machine is capable of efforts much superior to those that have been attributed to it.—*La Nature.*



COMPETITORS IN A STILT RACE.

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Two of our London contemporaries, *Iron* and *Industries*, have been united, and will be published under the title *Industries and Iron*. Each had a strong individuality. *Iron* had been published for seventy years. *Industries* was of more recent origin. We wish the publishers great success in their venture of combining the two publications.

## The Ancient Eclipses of the Sun.*

BY F. TISSERAND.

*Eclipse of Thales.*—We read in Herodotus:

"After that the Lydians and Medes were at war for five consecutive years. In this war, the Medes were often conquerors of the Lydians, and the latter also often conquered the Medes. Once, even, they fought at night. Now, as the war was kept up with equal chances on each side, one day in the sixth year, while the armies were struggling with each other, it happened that, in the midst of the combat, day was suddenly changed into night. Thales of Miletus had predicted this phenomenon to the Ionians and had indicated precisely this same year in which it actually occurred. The Lydians and Medes, seeing that night suddenly succeeded day, put an end to the combat and thereafter occupied themselves only with the care of establishing peace between each other."

It is probable that the phenomenon mentioned by Herodotus was a total eclipse of the sun, but the place where it was observed is not indicated. We only know that it must have been situated in Asia Minor, or at least very near that country. The date is no better fixed. Pliny places it in the fourth year of the 48th Olympiad, and Clement of Alexandria toward the 50th Olympiad. The various authors who have spoken of it since make the date vary between the 1st of October 583 and the 3d of February 623 B.C. In the opinion of Baily, the eclipse occurred on the 30th of September of the year 610. Mr. Airy puts it at the 28th of May 584, in relying upon Damoiseau's Tables of the Moon. This date, moreover, agrees with that of Pliny, and seems to present serious guarantees of accuracy. Hansen is of the same opinion as Mr. Airy, remarking that in the year 610 Thales was but thirty years of age, and that it is difficult to concede that at such an age he could have been so expert in the calculation of eclipses. At the other date, on the contrary, he would have been fifty-four years old. Such proof, however, does not seem to be decisive. Mr. Newcomb has devoted himself to a very concise discussion of this eclipse, and finds that three points only are well established by Herodotus' narrative, viz., that a battle between the Lydians and Medes was terminated by a total obscuration, that on the 28th of May, 584 B.C., the shadow of the moon passed over Asia Minor, as results from calculations based upon the tables, and that Thales predicted an eclipse. But he does not consider as demonstrated that these three phenomena relate to one and the same event.

*The Eclipse of Larissa.*—We read in Xenophon:

"When the Persians succeeded the Medes in the empire, the King of the Persians, besieging this city (Larissa), was unable to take it by any means; but a cloud, in covering the sun, caused such a darkness that the men came out of the city, and it was thus that it was taken."

According to the details given by Xenophon, it appears certain that Larissa was the modern Nimrod. Hence the position of the place of observation is well known; but is it very certain that the phenomenon under consideration was an eclipse of the sun? The text merely says that it was a cloud (*νεφελη*) that covered the sun. Conceding that it was an eclipse, it is not proved that it was a total one of the sun. Mr. Airy concedes the totality, and, with Hansen's Tables of the Moon, examining all the eclipses of the sun that took place in an interval of forty years comprising the probable date of the fact reported by Xenophon, he finds that on the 19th of May of the year 557 B. C. there was at Nimrod a total eclipse of the sun whose zone of totality was very narrow.

*The Eclipse of Xerxes.*—This eclipse occurred during the march of Xerxes against the Greeks, in the very year of the battle of Salamis. Herodotus says that the army had left its winter quarters at the approach of spring and had just left Sardis, marching upon Abydos, when the sun ceased to be visible and night succeeded day, although there were no clouds and the sky was exceedingly clear. It was evidently a total eclipse of the sun, of which we know the year (that of the battle of Salamis), the season, and almost the hour (morning). Moreover, the position of the place where it was observed is well determined. Unfortunately, the tables show that there was no total eclipse of the sun visible at Sardis at this epoch. We see no means of reconciling these two discordant facts. Mr. Airy removes the difficulty by conceding that it is a question, not of an eclipse of the sun, but of the moon, that of the 14th of March of the year 479 B. C. But it does not seem easy to reconcile this substitution of the moon for the sun with the text of Herodotus.

*The Eclipse of Agathocles.*—Agathocles being blockaded by the Carthaginians in the port of Syracuse, profited by a momentary suspension of the blockade to escape from the port and sail toward Africa, which he reached at the end of six days. On the second day of his journey, he was witness of a total eclipse of the sun. Diodorus Siculus reports the occurrence as follows:

"As Agathocles was already surrounded by the enemy, night having supervened, he escaped contrary to all hope. On the following day, there was such an eclipse of the sun that it might have been thought that it was really night, for the stars appeared everywhere. So the soldiers of Agathocles, persuaded that the gods presaged some calamity, were in the liveliest inquietude as to the future."

Here, with the appearance of the stars in broad daylight, there is no doubt possible—it was indeed a total eclipse of the sun, and the only one, perhaps, of the chronological eclipses of which the totality is absolutely certain. Unfortunately, we are not certain as to the route taken by Agathocles on his departure from Syracuse. We do not know whether he went directly toward the coast of Africa, or whether he sailed around Sicily in steering to the north thereof. In either hypothesis, at what distance from his starting point was he at the moment of the eclipse? This is what cannot be established with precision. There is an agreement as to the date, which is fixed at the 15th of August of the year 510 B. C. By a singular fatality, says Mr. Newcomb, the limits admissible in the position of Agathocles correspond almost exactly to those between which we may make vary the secular acceleration. One of the possible passages gives 12 minutes and the other 7 minutes or 8 minutes for the acceleration.

*The Eclipse of Stiklastad.*—This eclipse happened during a battle that the Christian warriors under the leadership of Olaf the saint, King of Norway, were waging against an army of pagan peasants in revolt. The following is what Snorre Sturleson has to say about it:

"The weather was fine and the sun was shining, but after the battle had begun, a reddish tint spread over the sky and sun, and, before the fight had finished, the darkness became as great as during the night." The position of the field of battle where the eclipse was observed has been determined with certainty, and this has permitted of fixing the date of the phenomenon, and consequently that of the battle, say August 31st, 1030. Now a recent work, which appears to be worthy of confidence, establishes, from historic documents, that the battle took place July 29th, 1030. If this is really the case, the eclipse must have happened more than a month after the battle, and we no longer know anything as to the position of the place of observation.

Summing up what precedes, it may be said that the chronological eclipses are not reported with sufficient precision to render it possible to conclude therefrom such or such a value for the secular acceleration of the moon. It seems that it is better to make use of them solely to throw a light upon chronology.

* From an article upon the moon and its secular acceleration, recently published in the *Annuaire du Bureau des Longitudes*.