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The Parachute, a French Invention of Distant Siamese Origin

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ABSTRACT—The invention of the parachute, belongs to the French physicist Louis-Sébastien Lenormand, born in Montpellier on May 25, 1757. The idea arose in his mind while reading a passage of the *Description of the Kingdom of Siam* of Simon de La Loubère, envoy extraordinary of King Louis XIV to the court of King Phra Narai in Ayutthaya. On December 26, 1783, provided with a paraphernalia of parasols and rods, Lenormand launched himself from the top of a six-meter tree and verified the softness of a fall which was comparable to the acrobatics witnessed by La Loubère. He immediately undertook the calculations of air resistance, of volumes, and of the appropriate surfaces for a parachute veil to obtain the slowest descent. In doing so, he transformed an acrobatic entertainment into an experiment in physical mechanics : the invention of the parachute had taken place.

In December 1999, 584 free-fall parachutes were simultaneously released in Bangkok, setting a new world record, in celebration of the seventy-second birthday and the completion of the sixth cycle of His Majesty King Bhumibol Adulyadej Maharaj. The setting was not just spectacular, it was relevant. Indeed, the parachute is the direct, though distant, realization of a Siamese idea.

By the end of the 18th century, the conquest of the air had reached a very rapid development in France. On 21 November 1783, the Marquis d'Arlandes (1742-1809) and Jean-François Pilâtre de Roziers (1754-1785) made the first flight in history, aboard a balloon inflated with hot air, which had been built by the brothers Joseph-Michel (1740-1810) and Jacques-Étienne de Montgolfier (1745-1799). On 1 December the same year, the French physicist Jacques Charles (1746-1823) took off in the first hydrogen balloon.

The fragility of the envelopes of waxed paper or varnished silk which allowed for the ascension of these balloons, and the danger of explosion of a mass of 800 cubic meters of gas as flammable as hydrogen, showed the urgent need to invent rescue equipment. This need became the obsession of the French physicist André-Jacques Garnerin (1769-1823) after he made several hot-air balloon, or “*charlière*”, ascents in 1790 and 1791 respectively. Indeed, barely eight years after the first manned flight, such ascents had already assumed the banality of a funfair attraction.

On the First Brumaire of Year VI of the Republic (22 October 1797), Garnerin attempted the first parachute jump in history. When the hydrogen balloon on which he was aboard reached an altitude of 600 meters, he succumbed to gravity in a nacelle equipped with a hemispherical sail. The sail used for this first attempt did not have a

chimney, i.e. a circular hole, at its center. Therefore, the air could only escape through the leading edges, which caused turbulence that was near fatal to the parachutist, and could have marked the end of this invention. Fortunately, Garnerin reached the ground unharmed; and the parachute, subsequently modified with the necessary improvements, obtained its long-lasting success with which we are familiar.



Figure 1. Bronze plaque installed in the Parc Monceau, in Paris, in 1997, at the spot where Garnerin landed.

“Here, on 22 October 1797, the Frenchman, André-Jacques Garnerin, made the first parachute descent in history from a free balloon.”

Actually, Garnerin’s jump was not the first occurrence in which air resistance was used as the engine of a mobile system. In 1794, the French officer, Jean-Baptiste Drouet (1763-1824), the same person who arrested King Louis XVI and his family during their attempted escape to Varennes, invented the first hang-glider in an attempt to escape from the Spielberg Fortress in Moravia where he had been detained as a prisoner of war.

On 12 October 1799, Garnerin’s efforts were imitated by a young lady, Jeanne-Geneviève Labrosse (1775-1847), who jumped into the void from an altitude of 900

meters, becoming history's first female parachutist. Parachuting was obviously one of the passions they shared, which led to their marriage soon after.



Figure 2. "Monsieur et Madame Garnerin." 19th century engraving. National Library, France.

Although Garnerin was indeed the first experimenter with a parachute, he was not, strictly speaking, the inventor of the parachute. Neither were Leonardo da Vinci nor other dreamers whose brilliant theoretical drawings remained without any practical follow-up. The technical elaboration of a parachute, initially spelled *parachûte*, belongs to a French physicist from Montpellier named Louis-Sébastien Lenormand (1757-1837). The practical idea for a *parachûte* arose in Lenormand's mind almost by chance while reading a passage from the *Description of the Kingdom of Siam* by Simon de La Loubère, extraordinary envoy of King Louis XIV to the court of King Narai (reigned 1656-1688) in Ayutthaya. A large part of this text had been republished in the *Histoire générale des voyages*, edited by the controversial Abbé Prévost almost sixty years after the first publication of Laloubère's *Description*, and more than seventy years after the scenes reported in this book took place. In his reading, Lenormand came across a vivid description of acrobatics performed to entertain the king in the royal palace. In this passage, La Loubère referred to a specific acrobat who amused the King of Siam:

A *Bambou* dancer of this sort, they call *Lot Bouang* [ลตบ่วง]; *Lot* signifies to *pass*, and *Bouang* a *hoop*.

There dyed one, some Years since, who leap'd from the Hoop, supporting himself only with two *Umbrella's*, the hands of which were firmly fix'd to his Girdle : the Wind carry'd him accidentally sometimes to the Ground, sometimes

on Trees or Houses, and sometimes into the River. He so exceedingly diverted the King of *Siam*, that this Prince had made him a great Lord: he had lodged him in the Palace, and had given him a great Title; or, as they say, a great Name. (La Loubère 1693: 47)¹



Figure 3. La Loubère, *Du Royaume de Siam* (1691).

On 26 December 1783, armed with a paraphernalia of parasols and rods, Lenormand launched himself from the top of a six-meter high tree and verified the softness of a fall which was comparable to the acrobatics witnessed by La Loubère at the court of King Narai. He instantly undertook the calculation of air resistance, of volumes, and of the appropriate surfaces for a parachute veil to obtain the slowest descent. In doing so, he transformed an acrobatic entertainment into an experiment in physical mechanics: the invention of the parachute had taken place.

A very unscrupulous man, Abbé Bertholon (1741-1800), to whom Lenormand

¹ Ils appellent un danseur de bambou de cette espèce *Lot Bouiang*, *lot* veut dire *passer*, & *boüiang* veut dire *cerceau*.

Il en mourut un, il y a quelques années, qui se jetoit du cerceau en bas, se soutenant seulement par deux parasols, dont les manches étoient bien attachés à sa ceinture: le vent le portoit au hazard, tantôt sur des arbres, ou sur des maisons, & tantôt dans la Rivière. Il divertissoit si bien le Roy de Siam, que ce Prince l'avoit fait grand Seigneur: il l'avoit logé dans le Palais, & luy avoit donné un grand titre, ou comme ils disent un grand Nom." (La Loubère 1691: 144)

had submitted the fruit of his reflections and calculations, immediately understood the originality of his work and appropriated its merit by publishing in 1784 a memorandum entitled *Des avantages que la physique et les arts qui en dépendent peuvent retirer des globes aërostatiques* [About the benefits that physics, and the arts which depend on it, can derive from aerostatic globes]. This usurpation of the invention was followed by other comparable indelicacies committed by Joseph-Michel de Montgolfier, the man who had designed the first hot air balloon in 1782, then again by the physicist Jean-Pierre Blanchard (1753-1809), who first crossed the English Channel in a balloon in 1785, which has long contributed to obscure the memory of Lenormand, and even more so the Siamese source of his invention (Blanchard 1791: 5).

Fortunately, Claude-Antoine Prieur-Duvernois (1763-1832), the physicist and politician better known as Prieur de la Côte d'Or and one of the founders of the famous École Polytechnique, discovered the deception of these authors and resolved to restore Lenormand's key role in the invention of the parachute. Therefore, he decided to publish verbatim the introduction to Lenormand's thesis in the prestigious collection of the *Annales de Chimie*:²

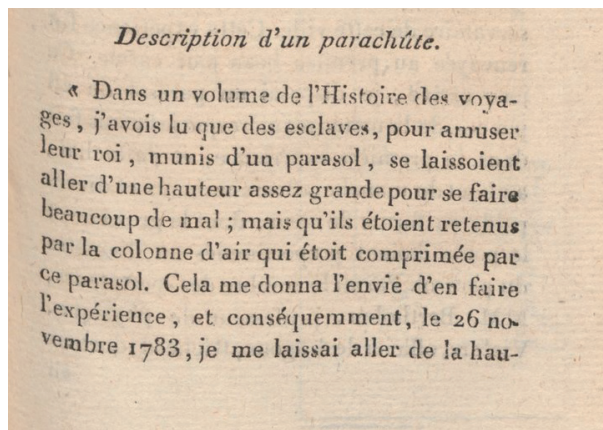


Figure 4. *Annales de Chimie*, October 1800, vol. 9, p. 95.

Description of a parachute.

In a volume of the *Histoire générale des voyages*, I read that slaves, to amuse their king, equipped themselves with a parasol, let themselves go from a height great enough to do themselves a lot of harm; but they were supported by the column of air which was compressed by this parasol. This made me desire to experience it, and consequently, on 26 November 1783, I let myself go from the height of a house's first floor, with a 30-inch parasol in each hand of which the ends of the ribs were tied together with strings, united to the handle, so that the column of air did not cause the parasole to bend backwards. The fall seemed almost without

² *Annales de Chimie, ou Recueil de Mémoires concernant la Chimie et les arts qui en dépendent*, published in Paris from 1798 to 1916, then replaced by the *Annales de Chimie et de Physique*, published from 1816 to 1919.

sensation to me when I did it while closing my eyes (...).” (Lenormand quoted in Prieur-Duvernois 1800: 94 sq.)³

Lenormand’s reputation was so well restored that the pendulum went too far the other way. A long-lasting rumor circulated erroneously crediting him with the first parachute jump, the circumstances to which were over the years increasingly fanciful. A plaque was even unveiled by René Pléven (1901-1993), the French Minister of Economy and Finance, on the Babotte Tower in Montpellier on 19 August 1945:

In memory of physicist Sébastien Lenormand
who in 1783 from the balcony of this tower
attempted the first parachute jump.⁴



Figure 4. 19th century popular engraving of Lenormand’s supposed jump. National Library, France.

³ “Description d’un parachute.

Dans un volume de l’*Histoire des voyages*, j’avois lu que des esclaves, pour amuser leur roi, munis d’un parasol, se laissoient aller d’une hauteur assez grande pour se faire beaucoup de mal ; mais ils étoient retenus par la colonne d’air qui étoit comprimée par ce parasol. Cela me donna l’envie d’en faire l’expérience, et conséquemment, le 26 novembre 1783, je me laissai aller de la hauteur [96] d’un premier étage, avec un parasol de 30 pouces, de chaque main, dont les extrémités de baleines étoient attachées avec des ficelles, et unies au manche, afin que la colonne d’air ne fit pas replier le parasole en arrière. La chute me paroissoit presque insensible lorsque je la faisais en fermant les yeux.”

⁴ “A la mémoire du physicien/ Sébastien Lenormand/ qui en 1783/ du balcon de cette tour/ osa le premier saut/ en parachute.”

Actually, from the top of the Babotte Tower, the highest monument of his hometown, Lenormand had only attempted to parachute a cast-iron weight, then a cat, then his own dog. These experiences were repeated in 1784 by the Marquis de Brantes (1759-1807), who threw a sheep from the top of the Palais des Papes in Avignon. Joseph-Michel de Montgolfier and de Brantes afterwards significantly improved the parachute by replacing the canvas mounted on a frame with a free canvas of strings held together by a balanced set of lines.

Anyway, the improvement of an invention is not the invention itself, and it is absolutely undeniable that the very first proper scientific conception of a parachute belongs to the reader of La Loubère's *Description of the Kingdom of Siam*, and amounts to the mathematical elaboration of the artistic entertainment that had been performed in Lopburi during the reign of King Narai the Great.

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