Neurological considerations in the history of tarantism in Spain

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ABSTRACT

Introduction. Tarantism is a complex phenomenon first described in the Middle Ages in Italy. It englobes three types of disorders: the organic effects of the bite of the Mediterranean black widow spider (latrodectism), the dance elicited by tarantella music, and behavioural changes that were hysterical in nature. In this article, we review the history of tarantism in Spain, emphasising the neurological components of the syndrome.
Development. Tarantism spread to Spain from the Kingdom of Naples in the first half of the eighteenth century. Most reported cases affected men who had been bitten by black widow spiders and exhibited symptoms of latrodectism. Treating these patients with tarantella music provoked dancing by a suggestion mechanism. The syndrome was at its most visible at the end of the eighteenth century, at the time of the official enquiry documented in *Expediente de la tarántula* by Francisco Xavier Cid and the case of the spider bite victim at Hospital General de Madrid. The nature of this entity was highly controversial; many scholars denied that it was an organic disease, and yet Spanish doctors spent many years prescribing the tarantella as the best treatment for spider bites. As a folk remedy, the tarantella remained in use until the second half of the twentieth century.
Conclusions. Tarantism in Spain arrived via Italy, but it usually did not present with hysterical manifestations. Rather, these were real cases of latrodectism with an added component: dancing provoked by the combination of suggestion and tarantella music.

KEYWORDS
History of medicine, tarantula, *Latrodectus*, hysteria, suggestion, music therapy

Introduction

La Mancha, August 1782. The High Council of Castille has named Don Miguel Cayetano Soler as the judge of the Commission established to look into certain reports from Daimiel and other towns in La Mancha. These reports inform him that the drought and heat have left the fields overrun by a plague of huge tarantulas and that a number of men have been brought low from their bites. He must also determine the truth behind the rumours that victims may be cured by tarantella music. Over several weeks, the Commission travelled through Daimiel, Manzanares, and Almagro collecting statements from eyewitnesses who included victims, doctors, and musicians. The statements are written on the 89 stamped sheets that make up *Expediente de la tarántula*.[1] These 'Tarantula Files' constitute the first official confirmation of tarantism reaching Spain. Before that time, the disease was unknown in our country, but once it had appeared it remained until the second half of the twentieth century.

This study chronicles the history of tarantism in Spain, with an emphasis on its neurological components.

Development

What is tarantism?

Tarantism is a syndrome first described in Italy in the sixteenth century. Nevertheless, evidence suggests that it had existed since medieval times, and that it had sometimes reached epidemic status.[2,3] This complex

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phenomenon has been both controversial and confusing since it was first described. Over time, it has been assigned different medical, psychiatric, sociological, and anthropological explanations. Historically, however, the term refers to any of three phenomena that often intermingle.[4] First of all, tarantism is the illness caused by a tarantula bite. Secondly, tarantism also refers to the dance displayed by spider-bite victims in response to music[2,5]; this dance would cure victims of what was considered a sure death. Lastly, tarantism was also used to refer to dancing and behavioural disorders of a hysterical origin. These behaviours were often triggered by music, with no need for a previous spider bite. This is consistent with the dancing mania appearing in the Middle Ages.[4]

1. Tarantism as an organic illness caused by the black widow spider

According to clinical descriptions from the sixteenth through the eighteenth centuries, spider-bite victims presented a macular or papular skin lesion with local pain or numbness. Some minutes later, they would exhibit a severe syndrome characterised by generalised pain and muscle contractions mainly affecting the thorax and abdomen, associated with profuse sweating, a weak and rapid pulse, chills, flushing, weakness, and sometimes neurological changes such as agitation, drowsiness, confusion, and tremor.[5-7] Recent studies show that these symptoms, as described in Spain in the eighteenth century, are perfectly consistent with the signs of latrodectism, the syndrome caused by the bite of the European black widow spider *Latrodectus tredecimguttatus*[4] whose range extends to the entire Mediterranean basin.[8-10] In those years, any large spider would have been called a tarantula, including wolf spiders currently classified in the genus *Lycosa*, including *L. hispanica* (once known as *Tarantula hispanica*), as well as the genus *Latrodectus*. All of them were believed to possess lethal venom,[6] but we now know that *Lycosa* bites affect humans in a similar way to bee stings.

Latrodectism symptoms are caused by α-latrotoxin, a protein that inserts into the presynaptic neuronal membrane like a transmembrane ion channel to elicit an influx of extracellular calcium to the neuron interior, producing in turn a massive release of neurotransmitters due to exocytosis.[10-12] This occurs on the levels of the neuromuscular junction, the autonomic nervous system, and the central nervous system (CNS). These events explain the larger part of the organic symptoms described in tarantism and latrodectism[4,12]: muscle cramps and spasms, generalised weakness, autonomic changes (tachycardia, changes in body temperature and blood pressure, hyperhydrosis, pallor, facial flushing), dyspnoea possibly resulting from cardiogenic mechanisms, and less frequently, CNS symptoms (agitation, anxiety, tremor, psychomotor restlessness, drowsiness, or low level of consciousness). Mortality due to latrodectism, however, is unusual, and most patients recover in just a few days with symptomatic treatment and maintenance therapy.[10,13,14]

2. Tarantism as a dance elicited by the tarantella in spider-bite victims

One of the main characteristics of tarantism was the reaction by spider-bite victims to a single specific type of music, the tarantella, with its fast upbeat tempo.[5,7] Bite victims with symptoms of severe latrodectism would begin to exhibit increasingly vigourous and often frenetic movements, including dancing or leaping as if they were healthy; this in turn resulted in profuse sweating. Several hours later, the patient would rest for a while, only to resume dancing again and again until symptoms resolved. This progression lasted an average of four days[5]; oddly enough, this was approximately as long as it took to cure the disease using the treatments available in the eighteenth century.[6] Dancing in eighteenth-century Spanish patients with latrodectism may have been due to a suggestion phenomenon that was facilitated by lack of education.[4]

3. Tarantism as a psychiatric disorder: the link to dancing mania

Italian descriptions of tarantism list observations that might be explained by spider bite or by the reaction to tarantella music intermingled with other, far more outlandish events.[5,7] Pietro Andrea Mattioli (1501-1577) described a wide variety of symptoms and behavioural changes in spider-bite victims; according to this author, they depended on differences in venom activity and on the temperaments of those affected. His list did include symptoms of latrodectism, but also referred to "maniacs, drunks, and madmen".[15] Giorgio Baglivi (1668-1707)

recognised that the typical symptoms of latrodectism were not observed in all cases; in turn, many patients presented disordered behaviours ranging from melancholy and suicide to sexual disinhibition, wallowing in mud, or being attracted to or repulsed by certain colours. These behaviours could also manifest during the dancing caused by tarantella music. Others cast themselves into the sea or buried themselves[16] or played at stabbing themselves with swords.[2] There were also descriptions of chronic cases and relapses in which the symptoms of tarantism reappeared every year on the same dates, and would subside when treated with music.[7,16]

It seems clear that many behaviours that had nothing to do with the biological effects of spider venom were nonetheless attributed to tarantism; in the eighteenth century, 'tarantism' was the term applied to any disease manifesting with movements, whether leaping, convulsions, or dancing.[5] St. Vitus' dance (enthusiasmus), a later name for the dancing mania described in the Middle Ages, was also called 'anteneasmus'. As early as 1669, Willis remarked on the similarities between tarantism and Saint Vitus' dance.[17] Until the late nineteenth century, 'chorea' remained a nosological hodgepodge of different diseases[18] ranging from Sydenham's chorea to a long list of choreiform disorders "such as tarantism, the hysterical dancing mania...belonging to the larger class of manic dementias".[19] According to Charcot, choreomania referred historically to an epidemic manifestation of hysterical origin in which music and dancing played a major role[20]; it was also promoted by religious superstition.[21,22] Mass hysteria phenomena continue to be described to this day. The first major epidemic occurred in Aix-la-Chapelle (Aachen) in 1374 and subsequently spread throughout Germany, Holland, France, and England; however, other episodes had already been described a hundred years earlier.[21] Thousands of people formed circles and danced, seemingly compelled to do so for days or weeks until they were exhausted.[21,22] The name 'St. Vitus' dance' was first given to an outbreak occurring in Strasbourg in 1518; the dancers were taken to the chapel of Saint Vitus in the Alsacian town of Zabern where they danced until they fell down, miraculously cured.[21] Dancing mania gradually vanished and had disappeared completely by the end of the seventeenth century. In later years, the term 'St. Vitus' dance' was used to refer to Sydenham's chorea.[21]

Dancing mania included strange events resembling others described in spider-bite victims, such as patients being unable to overcome their dislike for certain colours. In addition, as Willis stated, women affected by St. Vitus' dance would suffer relapses in the month of May when the saint's day was drawing near. This yearly recurrence was also clearly seen in tarantism cases from Apulia. This suggests that the elements of Apulian tarantism that cannot be explained by latrodectism probably descended from dancing mania when it began in the fifteenth century. In Italy, tarantism was sometimes a mass phenomenon, and it was associated with religious places.[3,23] According to studies performed in Apulia in the twentieth century, tarantism affected women almost exclusively[2,23]; when one fell into a fainting fit and claimed to have been bitten by a spider, news would spread and other patients would fall ill too until there was a group of about thirty. In a dancing frenzy, they would form a procession in the direction of the chapel, and once there, they would shout, pound the walls, and crawl on the floor. Nevertheless, as soon as the town choir began to sing, the patients would grow calm, join in singing, and gradually return to normal.[2] A similar situation was described in Dalmatia in the early twentieth century.[24]

Hysterical manifestations vary greatly and depend on both the patient's prior history and on the social setting. This being the case, anthropological explanations for tarantism are based on primitive notions of the relationship between illness and animals.[25] According to Schneider,[26] the tarantella would therefore be one of the so-called animal dances in which the dancer attempts to imitate the cadence and rhythm of an animal's gait. In doing so, the dancer would absorb the animal's power, which would act as an antivenom to neutralise its harmful effects. Another interpretation is that tarantism would be seen as a possession phenomenon,[27] as in the case of those affected by dancing mania; here, the spider would have taken temporary possession of its victim. In both cases, tarantism would have been viewed as the treatment rather than the disease. In patients with symptoms of latrodectism, who were mainly men, the purpose of treatment was to relieve physical problems; in other cases that were not clearly linked to spider-bite, as in the Italian women, the treatment would have addressed more or less subconscious mental conflicts.[23]

Arrival of Italian tarantism in Spain

Although there were no confirmed cases of tarantism in Spain until 1782, some episodes date back to 1756,[5] and there may have been even earlier cases. Tarantism

undoubtedly reached Spain from the Kingdom of Naples, which was part of the Spanish crown prior to the Treaty of Utrecht in 1713. Numerous Italian doctors worked in the Spanish court between the reign of the Catholic Monarchs and the eighteenth century. Italian tarantism had been known in Spain since the early sixteenth century. The first reports came from Spanish soldiers in Italy[16]; one by the name of Francisco Franco told Epifanio Ferdinando that many of his countrymen had been affected by spider bites in Apulia.[6] Books provided another source of information; they included *The book of the courtier* by Baldassare Castiglione (1534), *Silva de varia lección* by Pedro Mejía (1542), comments by Andrés Laguna on Dioscorides' *Materia medica* (1570), *Tesoro de la lengua castellana*, by Covarrubias (1611),[26] and the works of Father Juan Eusebio Nieremberg (1595-1658).[28] The tarantella is mentioned in various seventeenth and eighteenth-century Spanish plays[29]; compilations of Spanish music from the early eighteenth century also include examples of tarantellas.[3] Mattioli claimed to have cured a spider bite victim in Benamejí in the province of Córdoba (although there is no evidence that he ever travelled to Spain).[6] Considering the above, there may have been cases in Spain even in the sixteenth and seventeenth centuries.

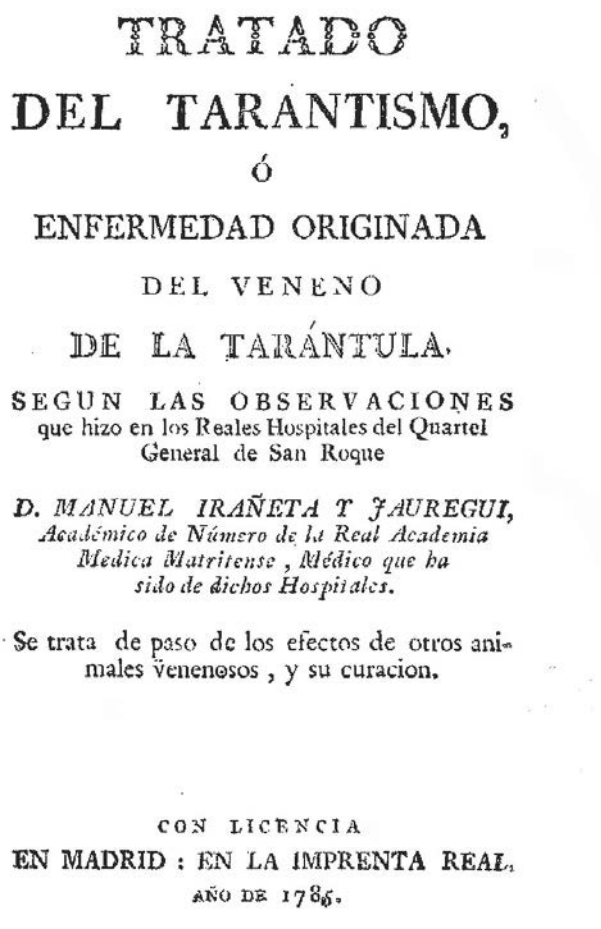

TRATADO
DEL TARANTISMO,
Ó
ENFERMEDAD ORIGINADA
DEL VENENO
DE LA TARÁNTULA,
SEGUN LAS OBSERVACIONES
que hizo en los Reales Hospitales del Quartel
General de San Roque
D. MANUEL IRAÑETA Y JAUREGUI,
Académico de Número de la Real Academia
Medica Matritense, Médico que ha
sido de dichos Hospitales.
Se trata de paso de los efectos de otros ani-
males venenosos, y su curacion.
CON LICENCIA
EN MADRID: EN LA IMPRENTA REAL,
AÑO DE 1786.

Figure 1. Cover of *Tratado del tarantismo* by Manuel Irañeta y Jauregui, 1786

By the late eighteenth century, tarantism seems to have become a well-established concept in southern Spain.[5] In fact, when a person was bitten by a spider, the townsfolk would call for musicians, and doctors would often do the same. As early as 1756, there were musicians in La Mancha who knew how to play the tarantella. In 1784, a doctor explained that an Italian stonecutter named Nicolás Mazarrén, born in Milan, had been the first to play tarantellas for bite victims in La Mancha some thirty years previously, and that the Italian had also taught many local musicians.[5] We suspect that musicians played a key role in the spread of tarantism throughout Spain[3]; they earned considerable sums from their tarantella sessions, and there was even a guild of tarantella players in Osuna (Seville province).[2] As retold by Willis, Ferdinando described how Apulian musicians travelled all over that region and made a good living as they took turns playing for full-day stretches.[17]

The first published records of tarantism in Spain

In the earliest published case of tarantism in Spain (1772), Juan de Pereyra describes a patient with latrodectism in Seville who was cured by listening to a minuet.[5,30] Following that, two brief notes appeared in *Gaceta de Madrid* in 1779 and 1781; they described patients in Carmona (Seville) and in Villafranca de Extremadura who were treated with volatile alkali.[31,32] In 1786, Manuel Irañeta y Jauregui described the effects of a tarantula bite on six soldiers from the San Roque barracks in Cádiz; five were taken ill in the summer of 1782[6] (Figure 1). In 1787, Francisco Xavier Cid published a book listing 36 cases of tarantism occurring between 1756 and 1782 and reported by several different doctors (Figure 2).[5] Most of the patients were from La Mancha (Moral de Calatrava,

Valdepeñas, Miguelturra, Manzanares, Daimiel); others were from Toledo (Arisgotas, Orcajo) and Extremadura (Llerena), including the case described by Pereyra. Cid had already consulted *Expediente de la tarántula* before publishing his book. Together with the *Expediente*, these two treatises document Spain's first cases of tarantism and demonstrate that the disease was not specific to the region of Apulia, contradicting Baglivi's claim and widespread eighteenth-century belief.

Both Irañeta and Cid were members of the Royal Academy of Medicine in Madrid. The texts by those two authors, and the one by Pereyra, provide accurate clinical descriptions of the effects of black widow bite on humans.[4] Nevertheless, their treatment approaches were radically different. Cid and Pereyra, who adhered to Baglivi's advice and experiences, were staunch supporters of the therapeutic effect of music.[5,30] While Irañeta did not go so far as to state that the cures by music therapy described by other authors were false, he proposed another treatment plan in line with the pathophysiological concepts of his time. On the one hand, he attempted to quicken the movement of the humours using bloodletting, oily lotions, and baths. On the other hand, he attempted to alter, separate, and expel the foreign substance injected into the body using "diluted humectant drinks with which to mix diaphoretics, stimulants, and solvents" such as vinegar and volatile alkali.[6]

It is important to note that Spain's cases of tarantism in the eighteenth century did not include hysterical manifestations. They were isolated cases, all of which affected young male farmworkers or soldiers who had been bitten by a 'tarantula', and their only symptoms were consistent with latrodectism, with no behavioural alterations. In only one case did doctors attempt to contrast Baglivi's reports; during the dance, they offered the patient a sword and watched him play with it, and they showed him different colours to ascertain his likes and dislikes.[5] Irañeta did not observe "preferences for or aversion to certain colours, or a desire for leafy branches or swords, or any of the other many reported and ill-fitting symptoms born of unbridled imagination or delirium".[6] Cid found that Baglivi's description of the initial symptoms following the bite were in keeping with his experiences. However, his characterisations of its later effects show the influence of other authors, such as Mattioli and Kircher, in that they describe very unusual events.[5]

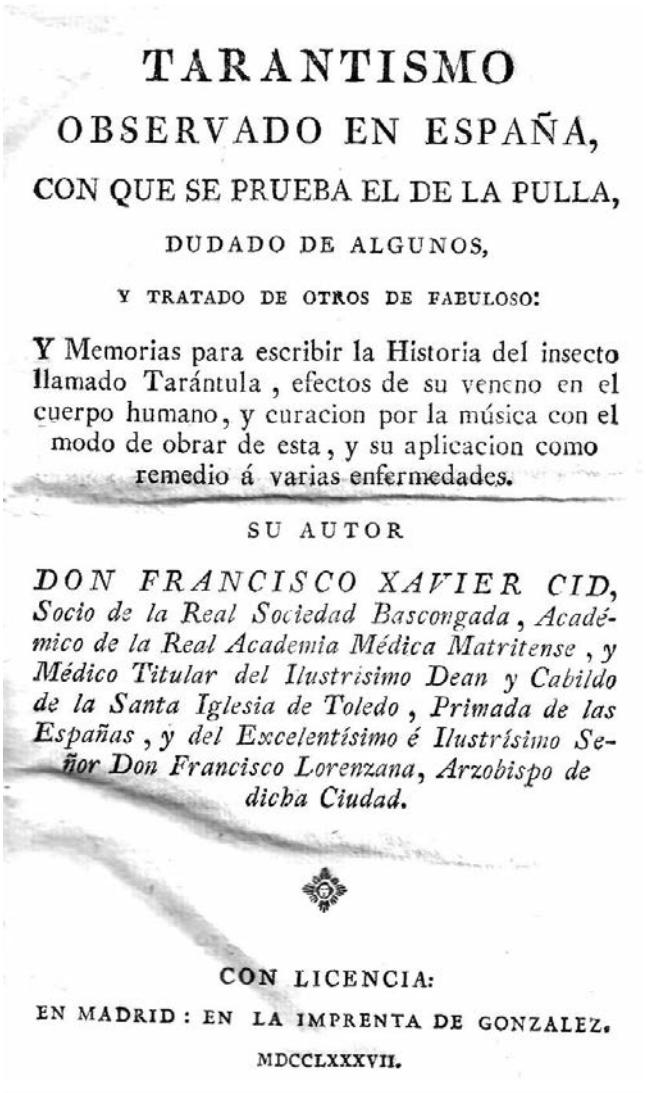
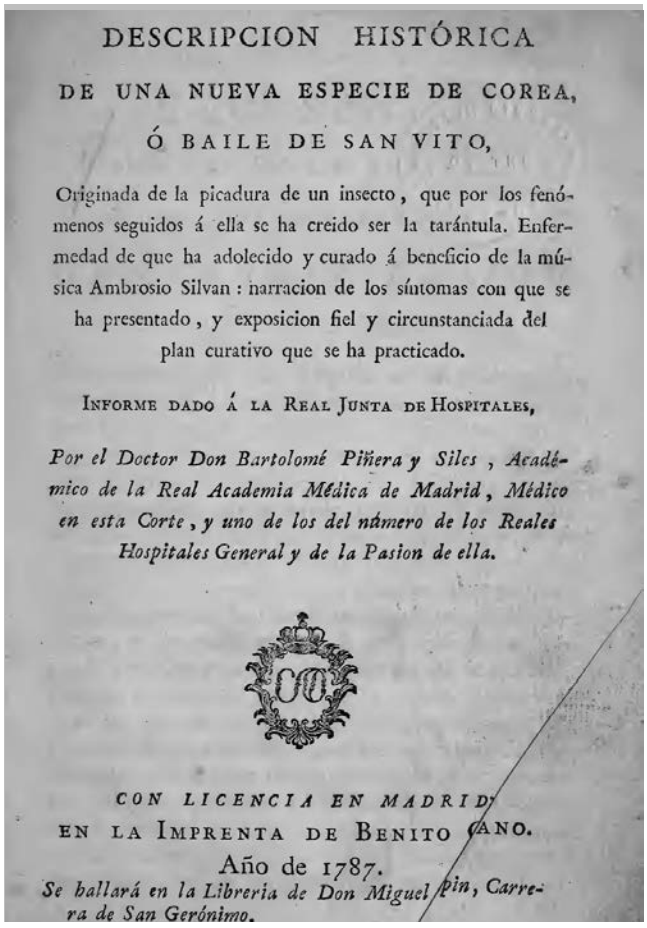

TARANTISMO
OBSERVADO EN ESPAÑA,
CON QUE SE PRUEBA EL DE LA PULLA,
DUDADO DE ALGUNOS,
Y TRATADO DE OTROS DE FABULOSO:
Y Memorias para escribir la Historia del insecto llamado Tarántula, efectos de su veneno en el cuerpo humano, y curacion por la música con el modo de obrar de esta, y su aplicacion como remedio á varias enfermedades.
SU AUTOR
DON FRANCISCO XAVIER CID, Socio de la Real Sociedad Bascongada, Académico de la Real Academia Médica Matritense, y Médico Titular del Ilustrisimo Dean y Cabildo de la Santa Iglesia de Toledo, Primada de las Españas, y del Excelentísimo é Ilustrísimo Señor Don Francisco Lorenzana, Arzobispo de dicha Ciudad.
CON LICENCIA:
EN MADRID: EN LA IMPRENTA DE GONZALEZ.
MDCCLXXXVII.

Figure 2. Cover of *Tarantismo observado en España* by Francisco Xavier Cid, 1787

Pathophysiological interpretation of tarantism in the eighteenth century

Both the effect of spider venom and the treatment approach involving music were interpreted in the seventeenth and eighteenth centuries according to dominant theories of the time. Contemporary doctors provided explanations drawing from the Cartesian mechanistic model, in which the human body is conceived as a mechanical and hydraulic system, and from the vibratory paradigm emerging in that epoch and


DESCRIPCION HISTÓRICA

DE UNA NUEVA ESPECIE DE COREA,

Ó BAILE DE SAN VITO,

Originada de la picadura de un insecto, que por los fenómenos seguidos á ella se ha creido ser la tarántula. Enfermedad de que ha adolecido y curado á beneficio de la música Ambrosio Silvan: narracion de los síntomas con que se ha presentado, y exposicion fiel y circunstanciada del plan curativo que se ha practicado.

INFORME DADO Á LA REAL JUNTA DE HOSPITALES,

Por el Doctor Don Bartolomé Piñera y Siles, Académico de la Real Academia Médica de Madrid, Médico en esta Corte, y uno de los del número de los Reales Hospitales General y de la Pasion de ella.

CON LICENCIA EN MADRID:
EN LA IMPRENTA DE BENITO CANO.
Año de 1787.
Se hallará en la Libreria de Don Miguel Pin, Carrera de San Gerónimo.

Figure 3. Cover of *Descripción histórica de una nueva especie de corea o baile de San Vito* by Bartolomé Piñera y Siles, 1787

explaining health and illness according to tensions or vibrations in fibres and nerves.[33,34] Musical vibrations would exert a mechanical effect on bodily structures, thus modifying fibre elasticity.[34] Baglivi, a supporter of iatromechanics, believed that tarantula venom had a clotting effect. It would cause coagulation of the humours, especially nervous fluid; this resulted in the symptoms of tarantism.[34] In contrast, waves generated by sufficiently vigorous and rhythmic music would affect bodily fluids and solids (including the blood, cerebral fibres, and nervous fluid); they were able to dissolve the humours and in doing so, give rise to physical agitation.[33,34] Furthermore, dancing would facilitate expulsion of the venom through perspiration.[34] Irañeta also wrote that tarantula venom alters "motor fluid contained in the nerves" (oddly enough, this resembles the action mechanism of latrotoxin) to produce spasms or contractions of the nervous system; excessive tautness of the nerve fibres compresses the blood vessels, resulting in coagulation.[6] Cid does not deviate from these interpretations, and his final chapter presents a "philosophy of music" explaining its effects on the human body.[5] On the one hand, according to the mechanistic concept, music would exert a relaxing effect on nerve fibres, thus reducing pain and inducing sleep. Cid also shows the influence of the vitalism of William Cullen (1710-1790) in that music, once "conducted by the organ of hearing and the auditory nerve to the seat of the soul", activates 'affect' at that location, and that action is transmitted by the nerves to the body:

> we observe the strength that the tarantella communicates to the nerves in bite victims, and the considerable turmoil it causes within them. As these nerves move they strike the sluggish humours and stir them to action; this effect is more prominent if the nervous humour is the one affected.[5]

The specificity of the effect of spider bite is due to "the particular nature of tarantula venom, in which the tarantella causes movement and irritation, also resulting in movement of the affected body parts"; this is consistent with the belief that certain sounds would make some objects vibrate, but not others. He proposes using music in "illnesses originating in thickened humours and lax fibres" (cachexia, hydropsy, vascular obstruction, paralysis). He believed that doctors did not treat patients with music only out of fear of losing face and looking foolish. "If music does not cure, at least it will do no harm", he concluded.

Tarantism in the public eye; the Hospital General case

In 1787, Bartolomé Piñera y Siles published a case of a 14-year old boy, Ambrosio Silvan, who exhibited signs of left-sided hemiballismus and chorea when he was admitted to Hospital General, Madrid, in June of the same year (Figure 3).[4,35] He was initially diagnosed with St. Vitus' dance as described by Sydenham, but Piñera believed it to be a case of tarantism when the patient exhibited "elation, joy, and jubilation" when shown the colour red (as Baglivi had described); although he had no symptoms of latrodectism, he did recall being bitten by a spider. He opted for the tarantella as treatment, after some initial doubs; the patient began to dance, apparently against his will, and we feel that this may reflect a

suggestion phenomenon.[4] The patient danced for more than a month without any clear signs of improvement before symptoms began abating gradually. He left the hospital on 5 September after a full recovery, which was probably due to the natural course of Sydenham's chorea.

Word spread in the Spanish court, among the neighbours and in the press[36]; people of all walks of life flocked to the hospital to see the spectacle of Ambrosio dancing the tarantella. In August 1787, *Expediente de la tarántula* was sent to the Royal Medical Qualifications Tribunal so that its members could prepare a report on that topic, but no such report can be found.[1] By July of the same year, newspapers were already mentioning the tarantula and its effects[36]; Cid himself published a leaflet including the description of the tarantula from his previous book, along with a report on the case[38] which quickly became popular reading material.[36] Another case of tarantism in La Mancha was published that same month.[39] And in the same year, a song called 'La tarántula' became fashionable in the streets of Madrid.[37] Public curiosity about the tarantula was such that one newspaper published the following announcement:

> With the permission of the General Superintendent of the Police, the true and venemous animal and insect known as the Tarantula will be shown in Calle Carretas no. 32, in the main room of the house of the Dentist; price, 4 cuartos each. Mornings from 9 to 1 and evenings from 4 to 10. Persons interested in seeing it are asked to notify us in advance.[40]

Conflicts about tarantism in the Enlightenment

A diverse body of famous authors and doctors of the Enlightenment denied the existence of tarantism as an organic disease. Francesco Serao (1702-1783) and François Boissier de Lacroix Sauvages (1706-1767) interpreted tarantism as a form of madness, and classified it among other 'errors of volition' that had nothing to do with the supposed effect of tarantula venom. They regarded tarantism as "a mystic event observed only among the credulous races".[5] According to Serao, "tarantism caused by chlorosis, melancholy, or nymphomania is no less feigned than that attributed to the bite of the tarantula".[5] Louis de Jaucourt (1704-1779), contributor to the *Encyclopédie*, also denied it the status of an organic disease.[34] Tozzi regarded it as a fable constructed by the lower classes, and commented that "some Spanish soldiers living in Tarento would make sport of the locals who would fall and weep like women after receiving multiple bites, as if they were feigning an illness or influenced by the spirits".[16] Also arguing against an organic explanation for tarantism were authors who cited the experiences of people who did not fall ill when bitten[6,42]; this was assuredly the result of bites by the *Lycosa* genus. Logically, neither Cid nor Irañeta accepted this interpretation, since they had witnessed the true effects of the venom. Cid criticised the authors who cast doubt on tarantism as a phenomenon without ever having observed it, and he argued that experience was important in understanding the illness.[5,42]

The controversy over tarantism was even reported in the Spanish press following the case of the bite victim at Hospital General and all of the alarm that it caused.[43] *El Diario* attempted to assuage the public's fears; citing various foreign authors who denied the existence of tarantism, it insisted that there was no proof of the phenomenon, which it described as "baseless invented stories".[44] *El Diario* later republished a study from a French journal of natural history and which also denied the existence of tarantism.[41] *El Correo de Madrid* was another newspaper to publish an article denying that the patient in Hospital General had tarantism. This article explained that tarantism was vanishing in Apulia because anyone of sound mind regarded it as a feigned illness or a delusion, whereas in Spain, its incidence was growing.[45] Two years later, such comments provoked a response from Cid, who argued at length against the sceptics.[42]

Tarantism in Spain during the nineteenth and twentieth centuries

In the 1790s, newspapers continued to report cases similar to those described by Cid, in which tarantism was cured by dancing, in Hinojosa (Badajoz),[46,47] Almendral (Badajoz),[48] and Mahora (Albacete)[36,49]. Although nothing on tarantism was published in the first decades of the nineteenth century, the phenomenon had not left La Mancha.[50] For quite a long time, Spanish doctors regarded the tarantella as the optimal treatment for tarantula bite victims. On 14 November 1807, the Spanish medical governing body, responding to a new request for a report on *Expediente de la tarántula*, declared the tarantella a powerful antidote to tarantula bites and recommended that it be practised in affected towns.[1]

In 1833, doctor and naturalist Mariano de la Paz Graells (1809-1898) studied a plague of poisonous spiders in the

towns of Vendrell and Plá (Tarragona province) and was the first to identify the genus *Latrodectus* in Spain. He described several cases in which bitten patients exhibited the characteristic symptoms of generalised pain, abdominal rigidity, sweating, chills, and dyspnoea.[51,52]

In 1843, Mestre y Marzal attempted to reawaken interest in the phenomenon of tarantism by publishing a pamphlet in which he claimed that both he and his father had observed many individuals affected by the illness in Campo de Calatrava.[50] He presented three cases of tarantism occurring in Meslanza (Ciudad Real province) in which an organic origin is more than doubtful, and which include relapses similar to those described by Italian authors. One woman aged 40 was bitten, which caused her to faint. Tarantella music was called for at once, making her dance and sweat copiously during eight days. One year after that, while she was pregnant, she suffered symptoms of melancholy with frequent collapses and one convulsion; the patient herself called for a tarantella when other remedies failed, and the music and dancing cured her in three days. The same symptoms and treatments accompanied her eight subsequent pregnancies. Another woman aged 24 experienced a generalised convulsion and adynamia over six days despite various treatments. When the bite mark was detected, musicians were called to play the tarantella; she recovered in a few minutes and began to move and dance, shouting frantically, and was cured after 15 days of music treatment. Her symptoms also returned a year later. One 16-year-old who was bitten, but whose symptoms were not described, was treated with the tarantella and found asymptomatic in 20 days. In the years that followed, hearing the tarantella would excite him and he would begin dancing uncontrollably. On his wedding night, the village boys tortured him by playing the tarantella when he tried to go to bed, forcing him to dance and sweat again and again all night. For the first time, a hysterical component was apparent in Spanish tarantism.

As recently as 1864, a medical article defended treating tarantism with dancing, although this was only to justify using tarantulas as a homeopathic remedy for a host of different diseases.[52]

Cases of tarantism would continue to be treated with dancing until the second half of the twentieth century. Gregorio Marañón cited the memoires of a doctor from La Mancha whose remedies included tarantella sheet music[53]; however, by the twentieth century, the dance had become exclusively a folk remedy in which doctors did not take part. In 1948, Schneider transcribed two women's oral accounts of tarantism in Aragon, as well as the story of a girl who had died 25 years earlier "because her mother hadn't called for a tarantella".[26] In Fraga (Huesca province), there were reports of tarantism as late as the 1940s. Here as well, patients were men who had been bitten by a spider while working in the fields, and they showed signs of latrodectism.[27] These patients did not dance or sway to the music, but they were cured thanks to the music played by the townsfolk , who were invited to dance, drink and dine, tranforming treatment sessions into local festivals. The music played in Fraga was not the tarantella, but rather, the jota.

In the province of Cádiz, cases of tarantism were still being reported in the 1960s.[54] It seems that this custom endured in the countryside; oral testimonies describe events and dances very similar to those of the eighteenth century. Patients had been bitten by a spider (a black spider in some cases), and their symptoms were consistent with latrodectism. Hallucinations and agitation presented in some cases. People were convinced that dancing was the only remedy for the venomous bite of the tarantula, and this belief was passed down from one generation to the next. Tarantism was diagnosed according to the response to music; if the patient improved, the bite had to have been that of a tarantula rather than another creature. People in Fraga and Cádiz alike subscribed to the belief that the patient would be cured once the spider burst from too much dancing.[26,27,54]

Additional cases of latrodectism in Spain were confirmed in the latter decades of the twentieth century,[8,9,13] but there have been no new reports of cases treated with dancing.

Conclusion

Tarantism spread to Spain from the Kingdom of Naples in the middle of the eighteenth century. Most of the cases to have been described were individual cases of latrodectism in which the tarantella elicited dancing through a suggestion phenomenon; however, conventional medicine without music was administered to some patients. Except for a few nineteenth century cases, hysterical phenomena diagnosed as tarantism were not observed in Spain although they were frequent in Italy. The entity was highly controversial in the eighteenth century; many scholars denied that it was an

organic disease even though Spanish doctors spent many years prescribing the tarantella as the best treatment for tarantula bites. As a folk remedy, the tarantella remained in use until the second half of the twentieth century.

Conflicts of interest

The authors have no conflicts of interest to declare.

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