LAZZARO SPALLANZANI, IN TRANSYLVANIA DRIVE

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Abstract:
The Enlightenment Revolution is a core element to understand grand narratives of the emergence of modern biomedical science. Despite attempts to create a more nuanced taxonomy of the remarkable transformation of knowledge of nature in this period, the hodoeporic writings by the Italian abbot Lazzaro Spallanzani are fundamental to understand a positivist and internalist approach in the development of experimental methods. During 1786 the sapiens’ travel from the Black Sea through Transylvania till Tara Ungureasca was full of natural, biological, social experiences coupled with medical and epidemiologic observations

Key words: Natural science, medicine, hodoeporics.

Science enlightenment
Collecting rare and ancient objects or things of aesthetic value, both natural and man-made, became very popular in European culture in the fifteenth and sixteenth centuries. These centuries witnessed the birth of Kunst und Wunderkammern “Rooms of Art and Wonders” in which the aim was to collect objects of astonishing originality which would stir and amaze visitors, as well as preserve the memory of Antiquity - indisputable aesthetic canon also for the modern.

Naturalia that is nature byproducts - even if featured as monsters - and Artificialia that is human artifacts, stimulated the common sense of observation and, most important of all, scientific interest and curiosity.

Those collections were the very start of natural history museums: tools for scientific research and cultural and social development. New technologies, geographic exploration and scientific traveling opened the pathway to famous scientists’ work. At the edge of XVIIIth century Antonio Vallisneri (1661-1730), Italian physician and biologist - a scholar at Bologna University with Marcello Malpighi (1628-1694) - appointed to the chair of Practical Medicine at the University of Padua, wrote:

“Many have observed and many still expect to observe, but not everyone has observed well, and others do not know how to observe, nor perhaps do they know how tricky the art of observation is, easily misunderstanding one thing for another, being blinded by the light, or not looking with due attention and diligence at what is to be looked at”.

He was one of the first researchers in medicine to reject the Aristotelian theories and he started the collection

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which is one of the best examples of those scientific gabinetti (laboratories) which turned to be university research laboratories where the experimental method in which Galileo was a master, became daily practice for scientists. Padua, Pavia, Bologna, and Modena at different periods in the XVIII century bloomed with the discoveries of their brilliant teachers and philosophers.

**Biography**

In the very shadow of the Northern Italy institutions of learning, Lazzaro Spallanzani (1729-1799), another Italian researcher, was keenly interested in the natural sciences and over his lifetime collected numerous specimens of animals, minerals and other natural objects.

He became a priest and eventually professor of natural history at Pavia, and was an enthusiastic traveller in pursuit of specimens for the natural history museum there as well as for his home private museum in Scandiano.

Fig.1. Spallanzani marble statue in his home town Scandiano, Italy

He was educated at the Jesuit College and studied law for three years before getting frustrated and dissatisfied. He then turned his great hunger for knowledge to science. He became a biologist and physiologist, studying body functions and the unknown wonders of the natural world. He also studied philosophy and mathematics and discovered that microbes can move through the air and can be killed by boiling. Almost a century later, Louis Pasteur (1822-1895) studied and then expanded his work, and got many of his ideas from Spallanzani. The Italian scientist studied many topics and stated that digestion is a chemical process and not just the grinding of food. He was first to do an artificial insemination of a dog. He wondered why a stone skipped over the water when it was thrown.

In 1768 an offer by Empress Maria Theresa, then ruling over Austrian Lombardy, to give him the chair of natural history and keeper of the museum at Pavia proved too attractive to be refused. He held this position until his death thirty-one years later. During this period (1768-1799) he distinctly disproved the theory of spontaneous generation which had been done by Redi (1626-1697) before the discovery of microscopic organisms had given its exponents a new basis for argument. His work on fertility blazed the trail for future investigators.

Mineralogy received distinct contributions from his labours. He was perhaps the first to study the ability of bats to avoid obstacles in flying after they had been blinded. The dissertations on digestion were read in all scientific circles; their contribution to physiology was monumental. The studies on circulation contained original and important observations. By his work on
respiration he first showed the real seat of combustion. Spallanzani was a Fellow of the Royal Society of London and a member of the Academies of Prussia, Stockholm, Gottingen.

The first known exploration into ultrasound physics happened in the 1790’s. Lazzaro Spallanzani wondered why bats could navigate at night and catch insects as they flew. He blindfolded them and they still manoeuvred very well. He then plugged their ears and found that they bumped into obstacles. He concluded that their primary mode of navigation was hearing. He deduced that they must emit ultrasound waves that are inaudible to humans and listen to the echoes to determine distance and direction of objects. This idea was received by his fellow scientists with ridicule and scepticism.

After the French army under Napoleon invaded Italy in 1796 Spallanzani was offered the position of professor of natural history at Paris but he declined because of his advanced age. On February 11th 1799, three days after an attack of apoplexy, having recovered sufficiently to recite Latin verse and having received the papal benediction, he died suddenly at 2:30 am suffering for a bladder cancer.

**Hodoeporics: eastbound travel**

Quite a few Italian travellers went to the Romanian area to work, to study, to make commerce, business and researches: Tommaso Alberti in the XVII century and in the following century Maiolino Bisacioni (1582-1663), Francesco Griselini (1717-1783) and the “Astrologer” Lazzaro Spallanzani, as he was called by his scholars after he showed an early penchant for astronomy.

Also another Italian naturalist, Domenico Sestini of Florence (1750-1832), crossed the Romanian area during the Century of Light almost in the same years when Maria Theresa’s son and previous co-regent Joseph II (1741-1790) was running the empire.

In August 1785, at the end of university lessons, Lazzaro Spallanzani sails from Venice to Constantinople. In the places he visits, he studies plants and animals, weather, the life and habits of those populations. He comes back travelling on land so he visits some mines and collects minerals in Transylvania, in the salt pan of Salzburg, in the gold and silver deposits of Zalatina, in the Carpathian metalliferous mountains. On December 7th, 1786 he arrives in Vienna and rich collection of minerals will be delivered to his university town one year later.

**Transylvania experience**

On August 16th, 1786 Spallanzani left Constantinople asking for the permission to go back home through the Transylvania drive to allow a deeper knowledge of mines and the natural area of Carpathian region.

He comes back travelling on land so he visits some mines and collects minerals in Transylvania. The deep desire to visit new geographic areas and to learn as much as possible prompted Lazzaro Spallanzani to travel back from
Constantinople joining the carriages of the prince of Walachia for a safer trip and to save money. Indeed he had already collected by Baron Sperges and the Austrian government a huge amount of money, worth 100 Venetian sequins, through Baron of Herbert in Constantinople.

On August 27th the caravan crossed Donau River and stopped in Skiera-Oltenza, in Walachia. Simplicity of life and a sincere hospitality welcomed the Italian scientist. Women are almost dressed as in the Ottoman area and Bulgaria but their face is not covered by any clothes. Crossing the village of Valek-Negest he was surprised to detect that people was dark skinned and curiously, dark skinned women were not at all beautiful and their breasts were pendulous offering from time to time a bare-thorax to the visitors eyes, “but they do not smell at all!”

After 12 nights he was forced to rest in the carriage, he arrived on August 28th in Bucarest where he was hosted by the prince Ypsilandi for five days. Indeed that nobleman was an employee of the realm, temporary nobility granted only to collect duties and local taxes, according to the arhondology’s laws.

Spallanzani visited the salt mines of Hani-Hanik and collected a huge amount of minerals. On the 5th of September he started his trip towards Kronstadt (Brasov) and the day after he stopped in the lazaret of Buza. Nearby the Bodza River a lazaret was open for quarantine every time plague was affecting people living in or crossing through Constantinople. The Empress Maria Teresa forced people crossing the borders to Transylvania to stop 3 or 6 weeks in Buza lazaret if infection was affecting the Ottoman area.

Corona or Kronstadt was only seven hours travelling from the lazaret and Spallanzani arrived there in the evening of 7th September while a cold eastern wind was blowing across the area. Not a word he wrote on his trip from Kronstadt to Hermannstadt (Sibiu) - under the military protection of 30 soldiers offered by Ospodaro Mauroceno - where he arrived on 12th September.

He visited the salt mine of Saltzbourg (Witzazna) and gold and silver deposits of Zalatna, where he arrived, crossing through Portu, on 24th September, in the metalliferous mountains very well known since ancient Roman time.

In that geographical area and near Alba Iulia many illegal coin minters - an ethnic group called Moti - were working as outlaw gold dealers and moreover “they know how to mint gold coins of the best quality and having the right weight”.

Moti lived in very miserable conditions and Spallanzani was very impressed by their skin chronic ulcers clearly related to advanced clinical syphilis: a terrifying map of typical open ulcers was covering all over their body.

The Italian scientist underlines that in the Turkish area he was unable to detect such big amount of venereal diseases’ skin tags. Moreover he states that in the Moti villages there were almost no children, clearly relating advanced syphilis to impossible pregnancies.

In Transylvania, the Walachi were about 1 million people; other inhabitants were Hungarians - the land owners - Siculi, Saxons, Germans, Armenians, Greeks (mainly merchants) and Bohemians. These were Gypsies classified as musicians, handcraft workers and Egyptians - that is gypsies working around and “mainly thieves”!
He left Transylvania for the Banat region and he arrived to Temeswar on the evening of 14th October when a stormy weather and rain offered to the Italian biologist an awful welcome. He will report the poor quality of air because of several ponds and local people affected by intermittent fevers. Transylvania is left and Vienna welcomes the Italian scientist on 7th December 1786.

His hodeoporic writings about the scientific tour through the eastern European countries were printed only a century after his death.

**Conclusion**

Spallanzani, in all his life as well as in his Transylvania drive, took a necessary and decisive step away from scholastic Aristotelian natural philosophy, with its sterile metaphysics and reputed reluctance to value laboratory experience. Laboratory tools joined Spallanzani’s travels and his studies reoriented the research of natural sciences away from the world of common sense observation and made it rigorously measurable and testable.

Beyond the stones, he collected through the Romanian area biologic, ethnologic, medical and social notes.

A great biographer, as great as a botanist, the Transylvanian academician Emil Pop (1897-1972) paid his tribute to the extraordinary personality of the Italian savant printing in 1942 a study of great erudition related also to Spallanzani personality. In the supplement of Emil Pop’s paper, as published in Timisoara in 1942, there is also a list of 60 different minerals collected by Spallanzani in the region.

Three big cases of minerals were dispatched, on Spallanzani order, by the Zalatna mines’ inspector, Immanuel Will by ship along the Donau River to Vienna. The acquisition of exhibits proved congenial to the most magnificent Museum of Natural History at University of Pavia. A great amount of natural history material items were collected in Spallanzani private museum in Scandiano, his hometown. The preservation of his private collection was a responsibility of his sister Marianna, a single woman who offered a great strength in the early attempts to preserve the items. She gained experience in taxidermy and in the preservation of stuffed-skins allowing a satisfactory preservation of the collections.

Difficult Mountain passes, floods and torrents, brigands and cut-throats, mines inspection to collect more specimen allowed to set up a unique natural science collection and the written records by Spallanzani feed social history information and therefore the wider world of individuals and researchers interested into medical history.

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