Original article: History of medicine

A case of "distillation" of human heads in the Eighteenth Century for medicinal purposes resulting in calcination of the cranium

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Abstract. Carlo Gandini (1705-1788) is known for the introduction of typical traditional Chinese Medicine practices into Italian medicine, and in particular, that of pulsology. Yet, his activity led him to perform other interesting experimentations, among which, human head distillation. Distillation from human heads was performed since the 17th century and permitted the obtention of an elixir prescribed to treat encephalic diseases. In this paper, we present his analysis, the result of his experimentation and what appears to be the first evidence of cremation, albeit unintentional, some one hundred and forty years before the first modern cremations.

Key words: head distillation, Cremation, Carlo Gandini, epilepsy

Introduction

For millennia, therapy has drawn from the three natural kingdoms of nature the medicines to be used, with a preponderance originating from the plant world. Even today, within traditional, complementary, and integrative medicine, plant-based medicines represent the majority (1). A recent example of their relevance is the 2015 award of the Nobel Prize in Physiology or Medicine to Tu Youyou for her discoveries concerning a novel therapy against malaria (2). Therapeutical treatments from the mineral kingdom were considered for centuries to be the second category of medicines (3). More interesting to us appears to be the analysis of remedies from animal sources. Until relatively recently, the use of extracts from animal sources was contemplated for hormone replacement therapy (4). However, in ancient pharmacopoeias, the use of medicines derived from the human body was also contemplated. The most common of these is blood, used in particular for transfusion purposes, although it has been linked to more controversial but unconfirmed practices (5), hypothesized to build and spread the *blood libel* against the Jews (6). In addition to blood, the use of specially treated human heads has been reported; these include not only cranial bones, but also whole human heads (7, 8).

In the works of Nicolas Lémery (1645-1715) (9), which at that time were considered a reference of chemistry and therapy (10), are described the procedure of distillation of the human head (7) and the therapeutic components used for the completion of the process (8). In fact, the use of distillate (elixir) of human head was prescribed in case of encephalic diseases, and first among them, epilepsy.

This paper presents the analysis of an eighteenth-century case of human head distillation, performed by the Veronese physician Carlo Gandini (1705-1788) (11). In addition to moral considerations, the description of distillation performed by Carlo Gandini is interesting for another reason: the description of its residues corresponds exactly to the results of the first

modern cremations (understood here as cremations performed in a modern manner by placing the body in a chamber under intense heat), which will only be used one hundred and forty years later (12). Thus, Gandini's description, which has apparently escaped the cremationist literature, can also be included in the historiography of modern cremation, among the experiences that preceded it, albeit unintentionally.

Carlo Gandini and the "distillation" of the head of man

Carlo Gandini could be called a physician of the past who was impatient with certain expressions of the medicine of his time, but he was an acute connoisseur of various medical realities. Opposed to dogmatism, he preconized solutions for the training and activity of the physician, which would be prepared and implemented only in recent times (e.g., consensus conferences, guidelines).

He was born in Verona in 1705, and perhaps conducted his studies at the University of Padua. We also know that he was in Naples in 1728, and in Sicily in the early 1730s. Around 1734, he embarked on a 22-year journey through Europe, including Spain, France, Germany, England, and Portugal. Returning to Italy, he settled in Milan and then Genoa where he spent the last 30 years of his life (11).

Gandini is considered to be among those who popularized Chinese and European pulsology (13), but here we are interested in mentioning one of his experiments in human head distillation. These experiments must have taken place in Palermo, and the procedure he adopted does not appear dissimilar to those cited. Mention of his experimental activity can be found in some pamphlets (14, 15) relating to a controversy over a clinical case in Cremona (16) Figure 1. He had also conducted sections of the human encephalon, finding thinning of the cortical part in patients whose pathology could be likened to a state of dementia (15).

Gandini was able to "distill" (using his term) the head of a 19-year-old man sentenced to death by hanging: all the parameters for the proper execution of distillation were met. His experiments took place with the consent of Agostino Gervasi (1667-1748), who would be *Protomedico* of Palermo (17). Gandini wanted to reproduce the distillation proposed by Lémery and obtained the results described by the French chemist and physician.

Regarding his distillation experiments, Gandini contacted Tommaso Campailla (1668-1740) (18), the distinguished scientist from Modica, with whom he was also in correspondence.

We might consider this experimentation merely a confirmation of what had already been experimented with elsewhere. However, some elements in his descriptions prove interesting for other reasons.

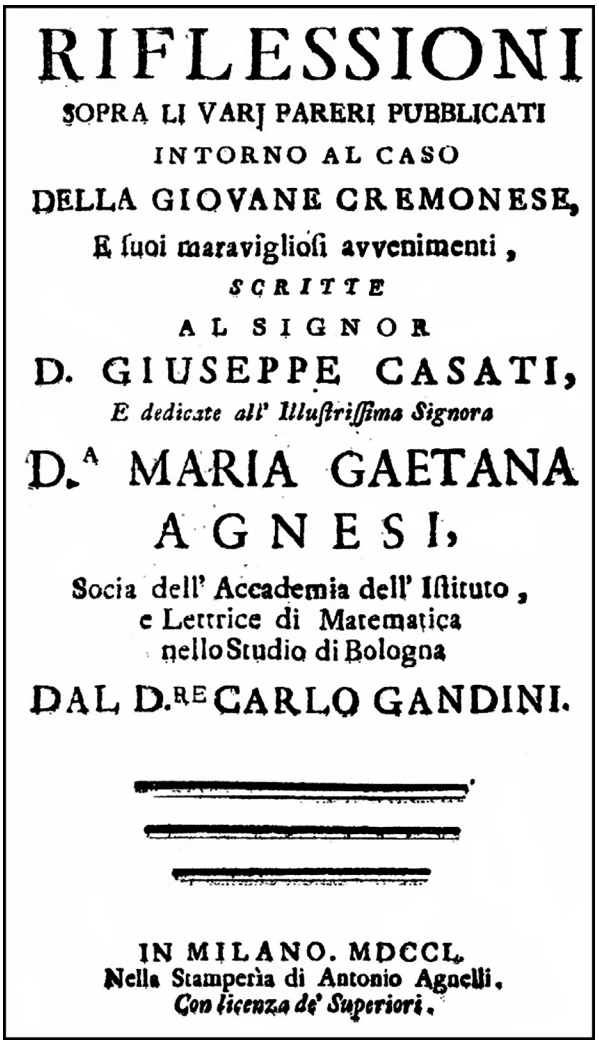

RIFLESSIONI
SOPRA LI VARJ PARERI PUBBLICATI
INTORNO AL CASO
DELLA GIOVANE CREMONESE,
E suoi maravigliosi avvenimenti,
SCRITTE
AL SIGNOR
D. GIUSEPPE CASATI,
E dedicate all' Illustrissima Signora
D.A MARIA GAETANA
AGNESI,
Socia dell' Accademia dell' Istituto,
e Lettrice di Matematica
nello Studio di Bologna
DAL D.RE CARLO GANDINI.
IN MILANO. MDCCL.
Nella Stamperìa di Antonio Agnelli.
Con licenza de' Superiori.

Figure 1. Frontispiece (Gandini C. Riflessioni sopra li varj pareri pubblicati intorno al caso della giovane cremonese, e suoi maravigliosi avvenimenti […]. Milano: Agnelli; 1750).

Ethical considerations

For sanitary and practical reasons, the heads to be used were not to come from exhumations, nor were they to belong to sick or elderly individuals, and therefore came from healthy young people who had died violent deaths. Another possibility was that the heads used for distillation were taken from the bodies of people sentenced to death.

The use of the bodies of people sentenced to death for scientific research raises several bioethical, medico-legal (19, 20), and medical-historical considerations. Although its usage has been attested for many centuries and continued up to recent times (21), several ethical issues may be discussed, including the violation of the right to consent when engaging in the use of dead bodies unauthorized by the deceased themselves or people personally affiliated or related to them; and the question of moral rights and duties, when utilizing a body offends public sentiments, indigenous traditions, religious beliefs, and conceptions about the fate and respect of the dead body for reasons that are not considered justifiable (contrary to, for instance, autopsy or exhumation to solve a crime). For example, regarding recent body exhibits, such as those entitled "Bodies: The Exhibition", the impossibility of preventing the use of bodies from Chinese internment camps still causes bitter controversy today (22).

The man's head and its mysterious contents

The cranium and its contents have always attracted the attention of physicians (23). That it was the seat of the highest functions was evident from ancient times: one thinks of Galen's anatomo-physiological system (24), which determines the seat of the *animal spirit* (i.e., the soul) precisely in the encephalon. Following the criterion of similarity, among the medicines from the plant kingdom used for the treatment of encephalic affections, and more generally of the nerves (25), were walnuts. The kernel, which emblematically represents the two lobes of the encephalon with their connections (and also the structure that divides them) is contained in the shell, which protects it. However, to treat the afflictions that interest us here, and especially epilepsy, it was necessary to use a medicine containing the animal spirit. This could only be achieved by using human heads, through a "distillation" process. The term "distillation" will be used here as it constitutes a direct reference to the terminology used by the authors cited.

Since the case of human head distillation was performed by Carlo Gandini in the 1730s, reference will be made to the pharmacopoeias of the time. In particular, the works of Nicolas Lémery will be analyzed.

"Distilling" the human head

The process of distillation of a human head did not differ from common distillation procedures. A prolonged heat source was required, and several retorts or stills were used for the actual distillation. A head of a young, healthy person who had died a violent death or underwent capital execution was used. Skulls of sick persons or from exhumations were not suitable, as in the former case the spirits had been consumed by disease, and in the latter, they had been consumed by the soil (8).

Soft skin and muscle parts had to be separated, denuding the skull. Once reduced to pieces with all its contents, it was placed for "distillation". After four or five hours of moderate fire, the intensity was gradually raised until all apparent activity ceased. The first part of the procedure served to distill the phlegmatic part: according to classical theories we remember that phlegma was the humor whose seat was located exactly in the encephalon.

The next part of the process, characterized by intense heat, led to the production of an oily substance and a deposition of substances on the inner surfaces of the glassware. Once the contents had been filtered out, they were again distilled in a sand bath: rectified human head spirit was thus obtained. It was mainly used for diseases related to the encephalon: epilepsy, apoplexy, paralysis, lethargy, and hysterical diseases. It could also be used as an antidote, sudorific, in palpitations, or against scurvy. The dose ranged from 4 to 24 drops (7).

Rectified head spirit could be combined with various substances, again for antiepileptic purposes (8). By-products of distillation could be used, but here we

are interested in emphasizing the production of the antiepileptic elixir: it was produced from rectified head spirit, combined with opium tincture obtained through distillation in wine spirit. The mixture had to be heated over low heat in a sand bath for two days before being used. This process produced a residue, which was considered a category of laudanum and could be used as such (7).

The cranium alone could also be used as an antiepileptic in combination with other substances: it was reduced to powder after being calcined (8).

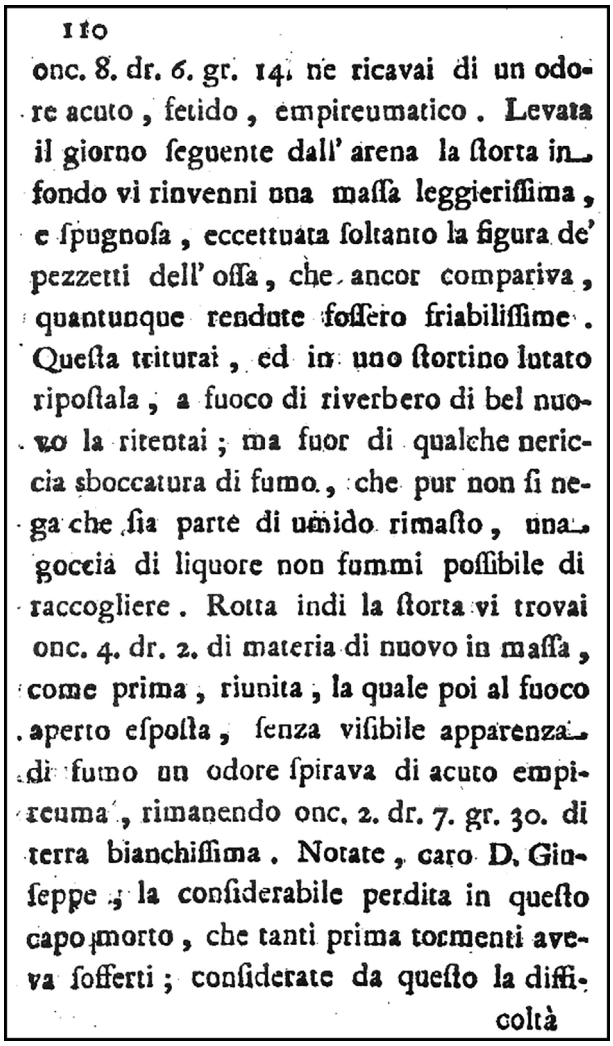
Conclusion: an *ante litteram* modern cremation

Regarding the residues of the various distillations, Gandini expresses himself thus:

[…] *Levata il giorno seguente dall'arena la torta in fondo vi rinvenni una massa leggierissima, e spugnosa, eccettuata soltanto la figura de' pezzetti dell'ossa, che ancor compariva, quantunque rendute fossero friabilissime. Questa triturai, ed in uno stortino lutato ripostala, a fuoco di riverbero di bel nuovo la ritentai* […] *rimanendo once 2 dramme 7 grani 30 di terra bianchissima* […] ([…] Removing the bottom portion the next day, I found there a very light and spongy mass, except for the pieces of bone which still appeared, although they were very brittle. This I crushed, and in a small retort I put again, in a blaze of reverberation I tried again [...] and remained 2 ounces 7 grains 30 drams of very white soil [...]) (15, p. 110) Figure 2.

The description of the preservation of the shape and the extreme friability of the osseous residues stands out, as does the mention of the absolute white color of the remains. To this we can also add what has already been mentioned, regarding the calcination of the bones of the skull. One hundred and forty years later, calcination would be taken as evidence of modern cremation (26).

Consequently, in Gandini's words here reported, we can recognize the description of the bodily remains following the phenomenon of modern cremation. Unknowingly, he found himself in the experimental conditions that would lead, one hundred and forty years later, to the realization of the first modern cremations.



110

onc. 8. dr. 6. gr. 14. ne ricavai di un odore acuto, fetido, empireumatico. Levata il giorno ſeguente dall' arena la ſtorta in fondo vi rinvenni una maſſa leggieriſſima, e ſpugnoſa, eccettuata ſoltanto la figura de' pezzetti dell' oſſa, che ancor compariva, quantunque rendute foſſero friabiliſſime. Queſta triturai, ed in uno ſtortino lutato ripoſtala, a fuoco di riverbero di bel nuovo la ritentai; ma fuor di qualche nericcia sboccatura di fumo, che pur non ſi nega che ſia parte di umido rimaſto, una goccia di liquore non fummi poſſibile di raccogliere. Rotta indi la ſtorta vi trovai onc. 4. dr. 2. di materia di nuovo in maſſa, come prima, riunita, la quale poi al fuoco aperto eſpoſta, ſenza viſibile apparenza di fumo un odore ſpirava di acuto empireuma, rimanendo onc. 2. dr. 7. gr. 30. di terra bianchiſſima. Notate, caro D. Giuſeppe, la conſiderabile perdita in queſto capo morto, che tanti prima tormenti aveva ſofferti; conſiderate da queſto la diffi-

coltà

Figure 2. Gandini's "distillation" (Gandini C. Riflessioni sopra li varj pareri pubblicati intorno al caso della giovane cremonese, e suoi maravigliosi avvenimenti […]. Milano: Agnelli; 1750, p. 110).

Thus, the description of the Veronese physician, which has apparently escaped the cremationist literature, can also be included in the historiography of modern cremations, among the experiences that preceded it.

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