General Medicine Open

Review Article

ISSN: 2515-4737

Moving beyond the narrow icon of criminal atavism: Cesare Lombroso as physician-philosopher and hypnotist in the sociocultural context of 19th century

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Abstract

This article stems from the need for restoring some relevant but skipped aspect of Lombroso's figure, especially his huge interest in hypnosis, an essential step for a more objective historical reenactment of his thought. Lombroso's wide range of interests, including psychiatry, anthropology and sociology, made him a great physician-philosopher embodying the positivist stance of his time. Hypnosis, he studied and practiced for over 20 years, was a relevant aspect of his profile. His view of hypnosis was sound and modern, overcoming the Charcot's (wrong) pathological interpretation of hypnosis as a form of experimental hysteria. He also moved beyond his initial theory of atavism, including psychological and cultural factor in criminality and holding a progressive system.

Introduction

Cesare Lombroso (1835-1909) is one of the most outstanding Italian physicians of his time. He was a psychiatrist, anthropologist, sociologist and, above all, a physician-philosopher embodying the positivist stance of his time; nicknamed "*alienista delle stadere*" ("*alienist of steelyards*"), due to his will to measure and obtain quantitative data of any investigated phenomenon, he collected a wealth of data, published a huge amount of books and articles and his papers were known throughout Europe. Lombroso is essentially famous as a father of modern criminology, a controversial one yet; in fact, due to his theories about physical features, atavism and congenital causes of delinquency he has been praised or disparaged, according the perspective adopted by different authors emphasizing the flaws of his theories or his brilliant intuitions [1].

He had wide range professional interests, leading him to investigate several psychiatric and medical disorders (e.g., *pellagra*) as well some ostensibly odd phenomena-i.e., Spiritism and hypnosis-he faced with a rigorous but open-minded positivist approach. Anyway, he has gone down in history essentially as a criminologist, though a double-faced one [1-4]. To our knowledge, only a couple articles quoted in PubMed deal with his interest in Spiritism and mediumship [2,5], while his studies on hypnosis have been substantially neglected or only marginally mentioned (Alvarado, 2010; Alvarado & Biondi, 2017). On the other hand, hypnosis remains a relevant aspect of his profile, despite historically looking less important than criminology: there are no valuable reasons for skipping it, apart from the century-old prejudice and a priori refusal of hypnosis in scientific medicine, leading to it being buried to oblivion, a fact endowed with deep historical and epistemological implications.

The aim of this article is to provide an outline of Lombroso's scientific approach to hypnosis, which at that time showed some links with Spiritism, mediumship, exorcism and Psi phenomena, such as extra sensorial perception and clairvoyance. In order to better appraise it, it is worth shortly sketching the sociocultural context of 19th century.

The European sociocultural context of 19th century

Medicine in 19th century: The essentially rural economy of 1700s underwent a huge change in the following century, thanks to the industrial revolution-including the introduction of steam machines and the use of both coal and oil in production and transport-which led to a deep transformation of Western social structure and conditions. These changes were paralleled by the progress in medicine and its sociopolitical implications. For example, Virchow in 1848 (the year of a cholera epidemic in Europe) stated that *"Die Medicin ist eine sociale Wissenschaft, und die Politik ist weiter nichts, als Medicin im Grossen."* ("*Medicine is a social science, and politics is nothing else but medicine on a large scale*") [7].

Despite the existence of prestigious Royal Colleges and Royal Academies in UK (The Royal College of Physicians had been founded in 1518 by King Henry VIII), both authority and competences of physicians were not well defined yet, and physicians and charlatans divvied up the marketplace. The development of bourgeois in the later 19th century also favored the development of medicine and its will to get rid from any shadow of quackery through an increasingly

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***Key words:** lombroso, hypnosis, positivism, criminology, hereditariness*

Received: March 25, 2019; **Accepted:** April 18, 2019; **Published:** April 20, 2019

rigorous scientific method. The renewed medical class was marked by a rigorous formation and the adoption of a code of conduct, at least in big towns. The New Poor Law (1834) also established the rules for medical assistance to low-income people in UK. In France a law of 1803 established the exclusivity of medical profession and introduced the concept of its illegal exercise, while in Germany most physicians were employers of the *Kurierzwang*, which provided medical care to everybody independently of economic conditions. In this climate, the scientific research and the renown of medicine grew up with personalities of the like of Pasteur in France, Jenner and Lister in UK and Koch and von Petterkofer in Germany.

As far as Italy is concerned, after stooding out from middle age through 1700' in the world of science, medicine, law, literature and art, it underwent a decline in early 19th century, favored by its political and administrative fragmentation preventing any far-reaching project. Following Napoleon's defeat, the Vienna Congress (1815) resized many powers through a conservative stance in order to provide a long-term peace and assigned the Veneto and most northern Italy to Austria. Then, the increasing friction between reactionaries and liberal-democrats led to the revolutions of 1848, followed by the recovery of conservative Austrian leadership; Piedmont was also defeated by the Austrians in 1849 and King Charles Albert had to abdicate and seize power to his son Victor Emanuel II.

Despite restoration, the bourgeois got more and more weight in the latter 19th century, favored by the scientific and technical progress, the related economic development and the birth of positivism, which, in turn, favored the progress of medicine. Giovanni Rasori, physician in Parma, resumed and reformed the John Brown's *Theory of Medicine* – considering diseases as a matter of over- or under-stimulation (sthenic and asthenic disorders, respectively) – holding the possibility of decreasing overstimulation by counter-stimuli. However, his theory was rejected by most Italian physicians (e.g., Bufalini and Panizza), being based on metaphysical-speculative assumptions rather than empirical observation of facts [8]. Then, the ideal and method of positivism were progressively adopted in Italian medicine thanks to several distinguished physicians, such as Jacob Moleschott in Turin, Moritz Shiff in Florence and Salvatore Tommasi in Naples. In other words, the Italian medicine of latter 19th century ranged between empiricism and positivism, philosophical positions which are worth of a short sketch.

Philosophical implications: Generally speaking, Empiricism is based on epistemological assumptions – i.e., the criteria at the base of knowledge – while positivism has an ontological *a priori* foundation: in fact, positivism establishes that the objective, external world is real and exists regardless of human perception and knowledge, while empiricism holds that knowledge stems from experience only. Empiricism has influenced positivism thanks to several philosophers, like Brentano, Mach and Spencer, also held by William James in USA, whose stance extended to Pierce's pragmatism. Ernst Mach warned against the positivist objectivism, stating that "*The belief in occult magic powers of nature has gradually dead away, but in its place a new belief has arisen, the belief in the magic power of science*", a stance strongly sustained by Carl G. Jung too. Mach paved the way to logic positivism and physicalism, introduced by the Vienna Circle in early 20th century [9,10].

In short, positivism embodies the *spirit of the time* of late 19th century – marked by the industrial revolution, the development of science and technology – with its materialist-objectivist perspective (at times inclined to naïve optimism), conceived by Comte as the third stage of human evolution, following the theological and metaphysical ones and limiting oneself to facts and their relationships [11].

In the field of medicine, the positivism held a rationalist, objectivistic approach, but also acknowledged the need for an empirical observation of facts. The empiricist approach emphasized the need for statistical methods, introduced by Jule Gavarret – i.e., collecting as much data as possible and submit them to mathematical and statistical analysis in order to check and understand facts – leading to concepts such as confidence rate, mortality and recovery rates being introduced [12]. The previously unknown concept of "mean man" was also introduced.

The development of positivism – with its objectivist-determinist stance – was paralleled by a seemingly dark side, i.e., the counterposed interest for Spiritism and hereafter. In 1843 Andrew J. Davies, a renowned medium, claimed to have Emmanuel Swedenborg as a guiding spirit, while Allan Kardec (Hippolyte Leon Denizard Rivail) claimed to be the reincarnation of a druid. In1848 two sisters, Margaret and Katherin Fox (Hydesville, NY), claimed a channel of communication with the hereafter, especially the presence of the spirit of a violently died peddler who lived in their house. In 1904, following the restoration of their house, his corpse was allegedly found in a space between the foundation walls, but this claim was disproved by further investigation [13].

The news about Spiritism spread all over the USA and Europe "*like a scourge*", as Lombroso himself commented, a fact calling for a rigorous scientific approach. A world congress of Spiritism was held in Cleveland in 1852, and the Society for Psychical Research was founded in 1882 with the aim of investigating the dark side of the occult with rigorous scientific methods (Alvarado, 2002). Spiritism was considered at that time a concrete and plausible possibility, and many outstanding personalities were members of the Society, including sir William Barrett, Pierre and Marie Curie, Freud, Jung and Francis Galton, as well as Cesare Lombroso. The International Congress of Psychology (held in Paris in 1900) included scientific sessions on Spiritism, where Charcot presented his findings on its relationship with hysteria and Lombroso with hypnotism.

The raise of interest for Spiritism depended on, a), a neo-religious climate in the period of restoration following the Vienna Congress, and, b), the scientific development, leading to the discovery of electromagnetism, X-rays and the introduction of electric light. The First International Exposition of Electricity was held in Paris in 1881, where the standard practical units – volt, ohm and ampere – were defined [14,15]. These discoveries introduced the evidence of new physical, invisible forces, allowing for a nexus of exchange between scientism, mysticism, mesmerism, and Spiritism, amplified by their sensationalization [16]. The introduction of photography also was an appealing tool in the attempt to objectively demonstrate the reality of Psi phenomena, which, according to Lombroso's hypothesis, might be made of physical, though rarefied and thus invisible, matter. At the same time, Jules-Henri Poincaré reported on the possibility to take pictures of the invisible, when using new rays able to trespass physical bodies [17]. At the end of 19th century the new scientific discoveries were also leading to the quantum physics revolution - started with Max Plank' *Quantum Hypothesis*– and paved the way to the view of a world made of interconnected dynamic phenomena, rather than inert, isolate pieces of matter. This was the climate imbuing Lombroso's thought [15].

Hypnosis: Hypnosis was introduced by Franz A. Mesmer in 18th century, but its origin can be traced back to eastern meditation and healing techniques. In ancient Greece, incubation was the healing

practice in Apollo's and Asclepius' temples – also called "sleep temples": patients were brought in the *abaton* (a secluded part of the temple), where all dreamed the god Asclepius providing the therapeutic suggestions. It was used for therapy of medical disorders and to allow for surgery in the first millennium b.C., and even before in the medicine of ancient Egypt (Edelstein & Edelstein, 1998, p. 235; Facco, 2014, 2017, 2018; Facco and Tagliagambe, in preparation).

Hypnosis was misunderstood and prejudicially rejected since its birth, despite its proved effectiveness in surgery in early 19th century. At that time, when no pharmacological anesthesia was available, several hundreds of surgical interventions with mesmerism (hypnotism) as the sole anesthetic technique were successfully performed, but this was not enough to let physicians understand and accept it. Esdaile, appointed Surgeon to the Government of India, reported a detailed description of over 300 major surgical operations performed under hypnosis at the mesmeric Hospital in Calcutta; nevertheless, he had to return to Scotland to justify himself in response to medical opposition. In the same year of Esdaile's book publication, the first interventions with ether anesthesia was performed, leading Robert Liston, a distinguished surgeon in London, to proclaim: "*This Yankee dodge, gentlemen, beats mesmerism hollow*" [17-24]. In fact, the problem was not to find and exploit effective all methods resulting to be helpful in clinical practice; rather, the Liston's comment reveals the need of a priori getting rid of hypnosis, due to its ostensible oddity and shadow of quackery. Later on, Theodore Meynert, at a medical congress in 1889, stated that "*hypnosis is surrounded by a halo of absurdity. Even recoveries do not prove anything*" (quoted by Freud, 1889).

At the same time hypnosis looked to be a hot topic in the world of the nascent scientific psychology. Hypnosis and its clinical applications were thoroughly discussed in the congresses of physiological psychology held in Paris in 1889 and 1900, and a series of books on hypnosis were published in the same years by several outstanding authors, including Janet, Liébeault and Lombroso himself. Richet, in this paper published in the Proceeding of the congress of physiological psychology, wisely recognized that "*Hypnotism is an admirable instrument of psychological vivisection. Thanks to the work of physicians and physiologists who have studied hypnotism, we are acquainted with the unconscious, we know that this unconscious accomplishes silently marvelous intellectual operations*" [25,26], for a detailed report on hypnosis discussion at that congress [6].

Then, hypnosis was neglected by mainstream medicine and psychology and buried to oblivion until late 20th century despite its proved effectiveness; as emphasized by Crabtree, what is puzzling is why the story of hypnosis is so neglected [27], a fact due to several reasons:

1. The ostensible incompatibility of hypnosis with the ruling post-Enlightenment rationalistic and positivist views – showing the strength of beliefs and prejudice even in science, leading to facts being denied in order to save accepted axioms and theories.
2. The historical link between hypnosis, Spiritism, psychical research, exorcism and masonry, all disciplines dealing with ostensibly occult, immaterial, unknowable forms of energy, i.e., unscientific doctrines.
3. The century-old idea of man as a monolithic being, beloved by God and endowed with a rational soul; this was an ill-founded, self-referential (one might say narcissistic) but well established opinion, leading to reject ostensibly irrational, absurd phenomena like hypnosis; instead, hypnosis allowed for the discovery of unconscious.
4. The misinterpretation of hypnosis and the terms used to define its phenomenology, insinuating a shadow of quackery or hinting to a pathological or anyway less-than-normal condition. They included the Mesmer's idea of animal magnetism, the definition of hypnotic state in terms of *trance* (a term common to both hypnosis and Spiritism), loss of consciousness and control, somnambulism, dissociation (mistakable for Bleuer's *spaltung* in schizophrenia), as well as Charcot's definition of hypnosis as experimental hysteria.

Hypnosis was reappraised only in mid-20th century, thanks to the seminal work of Milton Erickson [28]; since then, an ever-increasing interest in both research and clinical practice arose and now a wealth of data is available on its definition, effectiveness and neuro correlates. Today hypnosis is a well validated technique able to yield clinically meaningful psychological and physical changes-including changes of sensory and pain thresholds up to the level of surgical analgesia, as well as cardiovascular and neurovegetative changes-through an intentional introspective activity [29-33]. It has also proved the improve the outcome of perioperative period [34-36]. The same introspective intentional activity is also able to alter the activity of several brain areas and circuits through a top-down process [31, 37-42]. The whole of these data clearly shows the need for overcoming the old but still persistent prejudices about hypnosis and its effectiveness, as well as the related underuse in clinical practice. In this context, they may also explain the neglect of Lombroso's huge interest in hypnosis, even more concealed than the one in Spiritism.

Cesare Lombroso

A biographical sketch: Cesare Lombroso was born in 1835 in Verona from an Israelite bourgeois family. He was a gifted child and at the age of five years he read Plutarch and wrote poetry (Zerboglio, 1925). He was a free spirit and resented the Austrian domination of Veneto, which held the Roman Church and kept the Italian people subjected (some 4/5 of Italian people remained an alphabet in mid-19th century). He became a fervent follower of Auguste Comte and met Paolo Marzolo - a positivist physician form Padua – a fact probably favoring his decision to become a medical doctor.

Lombroso graduated in medicine in 1858 at the University of Pavia and in Surgery at the University of Genoa in 1859. Then he became surgeon in the Piedmontese Army until 1866 [43]. During his military service he improved wound management and recovery by careful cleaning and the use of antiseptics (phenol and alcohol), following the technique introduced by Joseph Lister. He also participated in the fight against brigandry in Calabria Region, where he studied the meaning of tattoos, he found to be more present in dishonest people; these data led him to start studying the personality of criminals and then correlate them to skull morphology [43].

According to Mantegazza, he approached the study of madness and dream in terms of brain physiology, considering them as an "*exaggeration of the laws of human mind*" related to a molecular movement of cerebral cortex [44]. Both Maury and Lombroso considered dreams as a result of "*forgotten memories buried in the unconscious, sometimes dating back to early childhood*" [8], and both madness and dreams as a sort of "*regressing metamorphosis*". Later on, Morselli claimed the Lombroso's paternity of the idea of regression, "*an axiom of Italian Psychiatry*" wrongly bestowed to Freud [45]. Anyway, there is a substantial difference between Freud and Lombroso: the former mainly considered regression as part of subjective individual history, the latter as a remnant of bio-anthropological evolution. Perhaps, they had the opportunity to exchange their ideas, both being delegates of the International Congress of Psychology (Paris, 1900) and members of the Society for Psychical Research. In 1863, he was

appointed chairman of Psychiatry at the University of Pavia, he shared with his military service until 1866. In 1871 he became director of the mental asylum at Pesaro, and in 1876 moved to the University of Turin, where he became professor of Forensic Medicine and Hygiene and, later on, professor of Psychiatry (1896) and Criminal Anthropology (1906). He died in Turin on October 19, 1909.

In 1876, he published "*L'uomo delinquente*", his best-known book which made him the father of modern criminology [46,47]; English and Italian versions, respectively. Due to his internationally renowned charisma, he was invited to preside over the mental illness session at the 12th International Medical Congress in Moscow (1897). Here, he had the opportunity to meet Lev Tolstoj with the aim to study his profile, according to his view of genius as a counterpart of madness [a theory he published in "*Genio e Follia*" [48,49], English and Italian versions, repsectively. The encounter was a failure: Lombroso, steadfast in his theory, thought that Tolstoj was a great but deranged man, while Tolstoj considered him a little, unsophisticated old man (despite seven year younger than Tolstoy) and disparaged his theories in his novel Resurrection" [50,51].

Lombroso and hypnosis: Hypnosis has been linked to Psi phenomena, Spiritism, multiple personality and possession since its origin. In 19th century the century-old idea of the rational soul as the foundation of man undewent a progressive decline and the first cases of multiple personalities were described. For example, Pierre Janet introduced the concept of "*doublement de la vie*" and hypothesized the possibility of healing hysteric patients by creating a second healthy personality [52,53]. Justinus Kerner reported on 11 cases of possession, of which 5 recovered following mesmerism [54]; he also described a case of possession explicitly mentioning the concept of multiple personality [55]. This link between hypnosis and exorcism at least partially depended on the fact that exorcism was also used in the attempt to cure medical as well as dental disorders.

Despite mesmerism had been progressively discredited – from the negative judgement of the Commission established by Louis XVI in 1784 up to the above-mentioned Meynert's opinion – hypnosis and its effects continued to rouse a persisting interest in latter 19th century. The medical class aimed to get rid of such a controversial practice with the flavor of charlatanism and fought a rearguard action against their pre-scientific past, seeking to establish what separated hypnotism from animal magnetism. Different positions were prevailing in European Countries: hypnosis was less studied in Belgium and Spain, while the two French schools of Nancy and Paris, dominated the hypnotic scenario in Europe. The former, directed by Bernheim and Liébeault, considered hypnosis essentially as a matter of suggestion, while Charcot at the Salpêtrière hospital in Paris held a pathological model of hypnosis, meant as a form of experimental hysteria. [56] criticized the positivist figure of Charcot with his huge power and directive use of experimental hypnosis: according to him, his docile hysteric female patients, virtuosos of hypnosis, accepted to reproduce epileptic-like symptoms on demand, due to his charisma and power-knowledge, providing the illusion of an insane suggestibility.

In Italy the political fragmentation and the cultural decline following the Vienna Congress favored divergent positions: the Papal State and Bourbons banned hypnosis, while in the Veneto Region the Hapsburg permitted its practice to physicians only. The Savoy were the most liberal and Turin became the core of Italian hypnosis, following the first studies started by Giuseppe Seppilli in Ancona, by Augusto Tamburini in Reggio Emilia, Achille De Giovanni and Lorenzo Ellero in Padua, and Antonio Tarchini-Bonfanti in Milan.

The approach of Lombroso to this still misunderstood phenomenon was based on the positivist paradigm. At that time, he was professor of Forensic Medicine and had had founded the *Archivio di Antropologia* – an official journal of anthropology, psychiatry and psychology – and was a distinguished progressive, secular professional. From 1886 his scientific interest was devoted to the hypnotism and then to Spiritism, considered as hardly understandable phenomena calling for a rigorous scientific analysis. Like Charcot, Lombroso started studying his hysterical patients, including a detailed history and physical examination, during which he measured as many parameters as possible by several tools – including Mosso's plethysmograph, ergometer, myotonometer, and Hipp's psychometer – and compared them to the data obtained from normal subjects. He reported his experience in *Studi sull'Ipnotismo*, a short outline of which is reported below [4].

According to the ruling opinion in 19th century, he considered hypnosis as a sleep-like condition in which the intellect was impaired. In his experiment he used strongly dissociative suggestions to investigate the phenomenology of hypnosis and its potentialities – e.g., suggesting a man to be a female or *vice versa*, or a child, to become a criminal, a musician, a colonel, or a celebrity (e.g., Giuseppe Garibaldi or Gioacchino Rossini), often within the same session. His analysis included the changes of several physiological and psychological activities induced by hypnosis, including memory, writing, will, intellect, muscular strength, perception (especially what he named *transposition of senses*), hemodynamic parameters and temperature. He also investigated whether hypnosis might influence the effects of medicaments and dealt with the forensic implications of hypnotism.

The ruling idea at that time was that the hypnotized subject was a passive one fully supine to the will of the hypnotist, a belief held by the first mesmerists-e.g., Armand Marie Jacques de Chastenet marquees Puységur (1751-1825), fellow of Mesmer – until mid-20th century; for example, Franco Fornari in his treatise of psychoanalysis still defined hypnosis as a relationship in which the patient was dominated by the therapist, a form of sublimated sadomasochist rapport [56,57]. Lombroso, despite inclined to share this idea, clearly reported that some patients were reluctant to the suggestion they did not appreciate (e.g., becoming a criminal) and some of them firmly refused what they did not like and "*immediately wakened up*" when the delivered suggestions were contrary to their personality.

The main Lombroso's results reported in his book *Studi sull'Ipnotismo* [4], were the following:

1. **Memory:** He reported on a non-speaking German subject who showed a huge empowerment of memory: he was able to perform a complex task based on recalling six groups of numbers or write a line read in a German book after half an hour. He also studied the post-hypnotic conditioning, interpreted as an empowerment of a supposed cerebral area dedicated to time memory. Among administered suggestions the "*identification with childhood*" resulted to be the most appreciated by the subjects; this appreciation was interpreted by Lombroso as a fact related to the physiological "*state of brain inhibition*" at that age.
2. **Writing:** Lombroso reported the changes of writing during age regression, where the subjects started using a childish penmanship, or during suggestion of being different personalities or professional (Figure 1). Here, he also noticed the limits of the power of suggestion, such as in the case of a man who, suggested to be a yang lady writing a letter to her father to ask for bride, wrote "*I wish to marry my wife*" (Figure 1, B4).

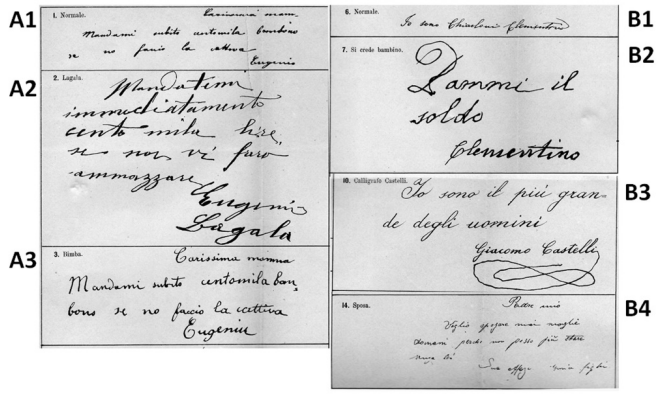

Figure 1. Writings reported by by Lombroso in two men in basal condition (A1 and B1, respectively) and during hypnosis, following: the suggestion of being a criminal (A2), regression to childhood (A3 and B2), the suggestion of being a calligrapher (B3), and a young lady writing to the the father to ask for marriage (B4). In B4 the subjects, despite suggested to be a woman wrote "I wish to marry my wife"

3. **Intellect:** Lombroso's observations during hypnosis led him to believe that intelligence or cognition (especially the speech) was impaired. On the other hand, he also reported that in some subjects the opposite was true. A subject with some musical knowledge (unfortunately no better defined), once commanded to become Gioacchino Rossini, wrote "*Dal tuo stellato soglio/Signor, ti volgi a noi…*" and wrote as well the music; commanded to play and sing it with piano, he also corrected an error of written music (a C sharp). Another man, commanded to be a female, was able to perform a cross-stitch broidery he never had learnt and was not able to do it again once "*awakened*" (dephypnotized). Of course, he observed that vulgar men, whatever the delivered hypnotic suggestion, remained as such and concluded that the phenomenon of ostensible new abilities during hypnosis might depend on previous learning stored at an unconscious level.

4. **Dynamometry:** Muscular strength was slightly increased in some subjects and decreased in others.

5. **Touch:** Lombroso reported the observation of only one hysterical patient, showing a slight decrease of touch and pain threshold, but, once commanded to be paralyzed, she remained fully insensible to all sensory modalities, including light and sound.

6. **Heartbeat:** No changes were observed with simple suggestions of changing the heartbeat, unless providing specific suggestions like being in a dance party or having a cold bath.

7. **Temperature:** It was not meaningfully changed, despite a slight increase was observed in some subjects.

8. **Effects on remedies:** Lombroso checked the effect of remedies on distance, previously reported by Bourru, Burot, Richet and Luys, as well as homeopathic physicians like Bicchman, and concluded that only one out of seven cases he studied showed such a phenomenon.

9. **Transposition of senses:** Lombroso shortly reviewed the observations of other authors about sense transposition – e.g., the shift of sight or smell to another body area, like chin, epigastrium or foot, commenting that this phenomenon is uncommon at best. With a modern intuition he speculated that in physiology too much attention was payed to sense organ and too little to cortical centers and stated: "*It is the cortical center which creates or excludes the vision, while the peripheral organ in these cases is less important than commonly believed*". Anyway, these facts had a material, physiological explanation and "*transposition was not a matter of creation of a new faculty*". He also mentioned a Janet's article dealing with induction of hypnosis on distance in Mme B., who, uninformed of Janet's action, started feeling numb and sleepy while he tried to induce hypnosis from a distance of about 500 m [58]. Lombroso reported that in his experience he observed such a phenomenon only once, emphasizing that, whatever its nature, it might anyway be part of still unknown physiological mechanisms, like those of orientation in inferior animals.

10. **Forensic medicine:** Lombroso warned against possible adverse events due to wrong use of hypnosis, which, in his opinion, might unmask or even cause disorders like hysteria, epilepsy, somnambulism-especially in public sessions of hypnosis performed by stage hypnotists like Donato- a fact also favored by the idea of hypnosis as a condition where the hypnotist's will took the place of the subject's one. At that time, being hypnosis considered as a sleep-like condition, he speculated that adverse events of hypnosis might be compatible with the ones yielded by sedatives, such as opium and chloral. In this regard, he considered the condition of hypnosis even worse, due to the lack of restriction to its use, unlike drugs. Thus, he recommended the use of hypnosis by alienists only, in order to preserve safety and prevent possible hypnotic epidemics, i.e. the diffusion of psychological disorders yielded by "*vulgar and unscrupulous hypnotists*".

11. **Applications to psychology and medicine:** Lombroso considered hypnosis as a sort of "*autopsy of psychological function*", in that it allowed to experimentally study psychiatric phenomena, like hallucinations, and check how imagination could effectively take the place of actual sensations. He interpreted the effects of hypnosis in a way compatible with the interest in magnetism at that time, i.e., that both psychological disorders and hypnotherapy might be related to changes of molecular polarization in the brain.

At the 1889 Paris Congress of Psychology, where many distinguished alienists and psychologists met, Lombroso presented a paper on the phenomenology of hypnosis, including hallucinations [59] (quoted by Alvarado [6]).

Due to Lombroso's renowed expertise in hypnosis, De Dubor consulted him, as he reports in detail in his book *The Mysteries of Hypnosis* [60]: "*About sixteen years ago I received a summons from London to Milan to attend an English lady who was suffering from the worst form of delusional mania. Finding myself in the neighborhood of Turin, I decided to profit by the chance, and to call in Lombroso for a consultation. He advised me to employ hypnotic treatment, but, as in this kind of mania direct hypnotism has usually little effect, the mind of the patient being morbidly self-centred, and therefore not amenable to the influence of suggestion, he recommended reflex hypnotism. By this method the patient, who is awake and fully conscious, is brought into contact with a hypnotized subject. The two are placed in chairs opposite each other, their hands are clasped, and the operator makes his suggestion to the hypnotised subject, with a probable effect on the subconscious mind of the sick person. I followed Lombroso's advice, and, at the end of three months, the patient was completely cured. This seemed to me so extraordinary that I determined to try a similar treatment at the British Hospital for Mental Diseases, which I had myself founded, in London, twenty-five years before, and of which I was the Senior Physician. Thanks to the eighty thousand cases which have been treated there since its foundation, I have had every opportunity of studying the subject from a practical point of view, and the cures obtained by this method of treatment were so remarkable as to surpass all my hopes*".

Among articles in newspapers about hysteria, hypnosis and forensic medicine, it is worth mentioning a letter by Morselli (coworker of Lombroso) to the *Corriere della Sera* (Milan) about a report of indecent exposure of a teacher in a school. In his letter he disapproved Charcot's theory of the close relationship between hysteria and hypnotizability and held the psychological interpretation of Berhneim and Liébeault, clearly claiming the view of hypnosis as a "*special psychological state*, *which can be managed with specific methods, and in non-pathological conditions, even in subjects fully sound of mind and body*". He also warned against the harmful legal consequences of Charcot's theory, i.e., testing hypnotizability in tribunals as a proof of mental disorders, wrongly leading to the defendant being absolved: "*Non all hypnotizable people are hysterical or neuropathic, instead hypnosis can be obtained in the most healthy subjects, totally free form any latent or manifest neurosis, or morbid hereditariness*" [61].

The Lombroso's thought was further developed by Morselli, who resumed the Faria's thought[1] and recognized that hypnotizability depended on subject's personality features, including gender, imagination, proneness to obey (yes-man) and, most of all, the trust in the hypnotist and the close rapport between the patient and the hypnotist [62]. He confirmed the somatic changes yielded by hypnosis and recognized the possibility of *hypnoidal* phenomena occurring without the need of a "*full hypnotic sleep*", while rejected the idea of sense transposition, defining it as a deceit. He also held the need for experimental study of hypnosis, withdrawing any exoteric or supernatural halo.

Morselli also claimed the Lombroso's authorship of the concept of regression, in his opinion wrongly assigned to Freud; in fact, Lombroso, resuming Giambattista Vico's philosophy (1668-1744), had previously defined *regressing metamorphosis*, a concept at the base of his theory on criminal atavism. As Morselli stated, this idea "*had alredy been devised and proved by that psychiatry to which [Freud] does not spare his gibes… Freud has renewed and completed it at best*" [45]. There is a substantial difference between Lombroso's and Freud's views, the former being a matter of anthropological and biological evolution and the latter of subjective, individual life experience. Anyway, there is no irreconcilable opposition between the two, which may be considered as two parts, two sides of the coin of the broader and complex interplay between physical-biological, environmental and cultural-psychological components of human life and evolution. As Freud himself stated, the analysis of dreams may also help perceiving the regression up to the early stages of the subject as well as human kind: "*That dreaming is on the whole an act of regression to the earliest relationships of the dreamer, a resuscitation of his childhood… Behind this childhood of the individual we are then promised an insight into the phylogenetic childhood, into the evolution of the human race, of which the development of the individual is only an abridged repetition influenced by the fortuitous circumstances of life. We begin to suspect that Friedrich Nietzsche was right when he said that in a dream 'there persists a primordial part of humanity which we can no longer reach by a direct path', and we are encouraged to expect, from the analysis of dreams, a knowledge of the archaic inheritance of man, a knowledge of psychical things in him that are innate. It would seem that dreams and neuroses have preserved for us more of the psychical antiquities than we suspected; so that psycho-analysis may claim a high rank among those sciences which endeavor to reconstruct the oldest and darkest phases of the beginnings of mankind*" [63]. This sentence shows that the different Freud's and Lombroso's views are not so incompatible as it looks at a first glance, but, rather, they belong to the broader debate on the relationship between ontogenesis and phylogenesis. This may also explain why Freud laughed at Lombroso, for his lack of differential diagnosis between epilepsy and hysteria, but also considered him a s great and wonderful man (quoted by [8]).

"I come to bury Caesar, not to praise him"

The famous beginning of Marc Antony's speech in Shakespeare's Julius Caesar (Act III, scene II) looks appropriate as the title of a brief discussion of the figure of Cesare (*Caesar*) Lombroso, given the need to overcome the narrow view and prejudicial denigration of his thought in last century. In fact, he has gone down to the history as the icon of criminal atavism with its supposed link to colonialism and racism in early 20th century. The disparagement was also enhanced by the Lombroso's strong interest for ostensibly non-scientific topics like Spiritism, hypnosis and homeopathy that Lombroso also cultivated for many years. Therefore, like in Marc Antony's speech, there is a need for reappraise and encompass the whole of Lombroso's thought, in order to give back to the history of science and medicine a more balanced and truthful picture of his contribution. The Lombroso's profile in psychiatry and criminology as well as interest in Spiritism have been recently reassessed and well discussed elsewhere [1, 2], while hypnosis has only been mentioned and needs for a proper reappraisal.

As far as his initial criminal anthropological theories are concerned, they, despite wrong, had the merit of bringing up the importance of scientific studies of the criminal mind and move beyond an exclusive philosophical and religious approach to wrong behaviors. According to Gatti and Verde [1], Lombroso himself moved far beyond the theory of criminal atavism in his late work, encompassing the role of social and economic factors, as well as the analysis of criminal behavior of powerful men, politicians and white-collars.

Despite Lombroso's wrong theory on atavism and hereditariness, its foundations are far from being buried and belong to the intriguing problem of localizationism – i.e., the brain localization of neurological and mental functions – started in ancient Egypt and firmly maintained until now with its warts and all. The most ancient document of brain functional anatomy is the surgical papyrus (2500-3000 b.C.), discovered by Edwin Smith in 1862 and translated by James H. Breasted in 1930: it reported 48 cases of brain lesions and their related physical symptoms (e.g., hemiplegia and aphasia), and included the description of the skull sutures, meninges and spinal cord fluid[2] [64-66]. Since then, a huge effort has been made by medicine and philosophy to try to understand the still unsolved mind-body and mind-brain relationships, the latter

[1]Abbé Faria was the first to recognize that hypnosis depended not on any supposed animal magnetism but on expectancy and the patient's cooperation. In 1819 he stated: "*I cannot conceive how mankind was peculiar enough to search for the cause of this phenomenon in some baquet, external will, magnetic fluid, animal heat, and a thousand other extravagant things*". He replaced the words animal magnetism by concentration and the term somnambulism by *epopt* and *lucid sleep*. [88], p. 55)

[2]It is worth mentioning that in western medicine brain ventricles appeared to be empty at dissections of decapitated corpses of executed criminals and, as such, they were considered as the site of the soul (*aer, spiritus,* a non-material substance) until 18th century. Andrea Vesalio was doubtful about that and in *De Humani Corporis Fabrica* (1543) stated: "N*on nego che i ventricoli elaborino lo spirito animale, ma sostengo che questo non spiega nulla sulla sede cerebrale delle facoltà più elevate dello spirito … Non sono in grado di comprendere come il cervello possa esercitare le sue funzioni*" ("*I do not deny that the ventricles may process the animal spirit, but I hold that this does explain nothing about the highest faculties of the spirit… I cannot understand how the brain may exert its functions*"). Only in mid-18th century, i.e., more than 4,000 years later than Egyptian physicians, Domenico Cotugno – eminent anatomist at the Ospedale degli Incurabili in Naples-described the existence of the cerebrospinal fluid in his *De ischiade nervosa commentarius* (1764), disproving the idea of the *aer*

named by David Chalmer the "*hard problem*", a problem with huge epistemological and metaphysical implications [67-69].

The theory of Lombroso is clearly a remnant of Franz Joseph Gall's (1758-1828) phrenology, a theory attempting to find the link between brain.

It is worth mentioning that in western medicine brain ventricles appeared to be empty at dissections of decapitated corpses of executed criminals and, as such, they were considered as the site of the soul (*aer, spiritus,* a non-material substance) until 18th century. Andrea Vesalio was doubtful about that and in *De Humani Corporis Fabrica* (1543) stated: "N*on nego che i ventricoli elaborino lo spirito animale, ma sostengo che questo non spiega nulla sulla sede cerebrale delle facoltà più elevate dello spirito … Non sono in grado di comprendere come il cervello possa esercitare le sue funzioni*" ("*I do not deny that the ventricles may process the animal spirit, but I hold that this does explain nothing about the highest faculties of the spirit… I cannot understand how the brain may exert its functions*"). Only in mid-18th century, i.e., more than 4,000 years later than Egyptian physicians, Domenico Cotugno – eminent anatomist at the Ospedale degli Incurabili in Naples – described the existence of the cerebrospinal fluid in his *De ischiade nervosa commentarius* (1764), disproving the idea of the *aer*. anatomy and behavior based on the false assumption that mental functions and attitudes could be predicted from skull morphology [70]. Gall, Spurzheim (1776-1832) and Combe (1788–1858), examining individuals with prominent attitudes (such as combativeness, cautiousness and so on), built up a map of cranial surface divided into 26 different areas supposed to correspond to specific psychological traits [71] (Figure 2). Later on, Jean-Baptiste Bouillaud (1796-1881), defining aphasia as a disorder of language rather than memory, paved the way to Paul Broca (1824-1880) and Carl Wernicke (1848-1905), who defined motor and sensory aphasia, respectively. At the same time Jackson showed the propagation of the epileptic focus from one brain area to the adjacent one, while Cajal (1852-1934) held a radical localizationism by stating that neurons were autonomous units. Thus, Lomboso was embedded in a vast, endelss process of brain localizationism, anyway a process not devoid of false but plausible ideas at any given time.

Nowadays the whole of theories ranging from physiognomics to phrenology are ironically referred as "bumpology", the last remnants of which waned in the Lombroso's craniometric techniques before being considered definitely outdated, settling phrenology as a ridiculous accident. On the other hand, all great men of the past interpreted

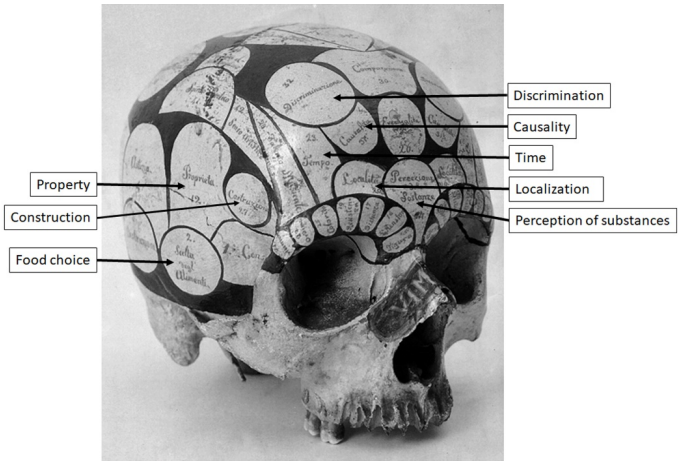

Figure 2. Phrenologic skull (the localization of some supposed skull-brain mental functions is indicated. Museum of Anthropology, University of Padua; modified from Facco, 2014)

the reality according to the available information, the *Zeitgeist* and *Weltanschauung* of their time, sometimes holding ideas shockingly disproved by subsequent knowledge and observed facts. For example, Lord Kelvin, one of the most outstanding physicists of late 19th century, in 1895 claimed that "*heavier-than-air flying machines are impossible*" [73], while in 1900, in an enthusiastic, positivist mood claimed before the British Association for the Advancement of Science that "*There is nothing new to be discovered in physics now. All that remains is more and more precise measurement*" [72,73]: only a brief Victorian calm before the *quantum storm* introduced by Max Plank on October 8th of same year. Likewise, Albert Einstein did not accept the concept of entanglement, what he named the "*spooky action at a distance*". In the well-known paper published in1935 with Podolsky and Rosen in the attempt to disprove it (since them known as the EPR paradox from the initials of their names) the authors concluded that "*No reasonable definition of reality could be expected to permit this*" [74]. Nevertheless, the phenomenon existed, and, despite ostensibly incompatible with Einstein thought, was demonstrated later on by Aspect et al. [75].

Thus, the questionable or even unfounded Lombroso's ideas must be reapprraised taking into account the spirit of his time, checking the value of his intuitions as well as recognizing and leaving his (hardly avoidable) errors to the history and its context without stigmatizing him. Being the Lombroso's approach to criminals based on evolutionism and localizationism – approaches far from being buried to date – what is essential is to take lesson from his errors in order to avoid repeating similar ones concealed in an up to date, more sound and appealing scientific approach.

Brain localizationism led to consider human brain as composed of highly specialized and more or less functionally independent elaboration centers until late 20th century. Only in recent years the concept of connectome has emphasized the need for overcoming the limits of a too strict separation of functions into modules. The idea of localization, which has gained more and more ground in the explanation of cognitive phenomena, implies the notion of isolable system. Although phrenology has been definitively withdrawn from science, and Lombroso's theories disparaged, we still risk repeating the same conceptual errors, by replacing bumps, mental organs, inclinations, instincts and faculties with brain areas looking to be active during instrumental tests without considering that they may be only a part of a more complex undetected phenomenon. In other words, it is to wonder whether remnants of the pseudoscientific approach of phrenology may survive somewhere today in science and culture, as a bug hidden in other disciplines.

According to Georges Lanteri-Laura [70-76], the name of Gall reappears every now and again in mid-XX century literature related to anatomy and physiology. For example, Bailey and von Bonin in the fifties mentioned that anatomists might thanks Gall's work for the idea of localizing brain functions and the intuition of a link between cortex and behavior. According to Penfield and Rasmussen (quoted by Lanteri Laura), Gall's work was simply too early to be founded upon unquestionable data, although containing the basis for the following discoveries. The shadow of Gall's phrenology has also projected itself on the pathetic studies of anatomic features of the brain of geniuses and political leaders, such as Einstein and Lenin [77-79], which, needless to say, were disappointing. On the contrary, they clearly showed that mind faculties are far from being related to a simplistic regional anatomy: we could say, using the informatic metaphor, that genius is a matter of software, rather than hardware, despite a good hardware remains essential.

The same is for modern behavioral genetics, the goal of which has been the understanding of psychological conditions in terms of genetic endowment. Its intent is to find specific genes related to psychological features and, thus, enable one to find the markers of mental diseases (e.g., schizophrenia) and criminal attitudes: this intent discloses a phrenological tuning, a new edition of Lombroso's phenotypical criminal anthropology concealed in scientific genotypic anthropology. In fact, several statements of behavioral genetics are not based upon pseudoscientific assumptions, but on the most rigorous modern scientific approach; nevertheless, Platt and Bach addressed the nature-nurture controversy by reviewing a series of erroneous statements in behavioral genetics regarding intelligence, homosexuality, religiosity, proneness to divorce, criminal attitude, career choice, homosexuality and schizophrenia [80]. They concluded that these genetic claims depended on questionable assumptions, such as granting validity to heritability estimates for humans and capability of assessing their quantitative contribution to behavior, and conceptualizing the genotype as having a range of potential outcomes. The latter recalls the teleological, finalistic interpretations provided by religion before the development of modern science. Probably, genes look to be mere instructions for molecule production than the exclusive actors of adaptation, while gene transcription in response to the environment is epigenetic in nature; metaphorically, the genes may play the role of Linotypes in a typography, where epigenetic signals are the typographer responsible for their choice [81]. An awkward endpoint of this stance was the project by the UK-Border Agency to use genetics to determine nationality, in order to tell the origin of asylum seekers [82]. This absurd project is an example of the risk of wrong outcome of simplistic claims in genetics, which in the past already yielded true political monsters such as Lysenkoism [83].

To summarize, neither the Lombroso's errors should be stigmatized, nor his other fields of interest should be neglected. Rather, his *bona fide* studies on criminals should warn us against the tricky path and uncertainties of empirical sciences and, especially, of too plain equations between physical features (be it the skull or small subcellular fragments) and the far more complex interrelationship mind↔brain↔body↔world. After all, phrenology might be viewed as the yesterday's genetics, and Lombroso as the forerunner of contemporary biological psychiatry and its implications in the criminological field: thus, some assumptions of behavioral genetics are at risk of being considered ridiculous tomorrow, as phrenology does today. The common bug is metaphysical in nature, i.e. the endorsement of an eliminative materialistic stance, fascinated by objectivism and denying any value to subjectivity, experience, culture and mind. An error that Lombroso did not commit, given his capacity to move beyond his initial narrow theory and to study subjective phenomena, extending to social, cultural and psychological factors, including hypnosis and Spiritism.

The denigration and derision of Lombroso depends on two factors: a specious and politically oriented criticism and a posteriori fallacy of the slippery slope [1]. The latter is the inclination to negatively judge the Lobroso's theory, due to its consequences, i.e., the supposed relationship with the ideological eugenics of early 20th century endorsed by racial laws. Instead, what happened was the result of complex historical and cultural factors, including the eugenics introduced by Francis Galton (1822-1911) in UK, the claimed superiority of Western culture claimed from Enlightenment through the Victorian era and giving rise to colonialism, as well as the development of genetics and positive sciences.

Lombroso, as he himself stated in *After death – What?* was an honest positivist scientist: "*I had made it the infatigable pursuit of a lifetime to defend the thesis that every force is a property of matter and the soul an emanation of the brain… But if I have always had a passionate devotion to my special own science, my own flag, I have had still more ardent love of the truth, the verification of the fact*" [84]. In other words, his theory, with goods and flaws, pertains to the world of science and has no responsibility in subsequent bad ideologies resulting from far more complex reasons, while the above-mentioned sentence shows his deeply positivist stance as well as his intellectual honesty and mind openness. Both of them allowed him to face topics like hypnosis, prejudicially misunderstood or refused by most physicians, as Freud witnessed in his introduction to the book *Der Hypnotismus* by Forel [25]. The same prejudice has survived until recent years, leading to hypnosis being a priori neglected for most 20th century and still being devalued and underused by the ruling mechanist-reductionist stance of mainstream medicine. In fact, the latter is devoted to cure the disease rather than the patient, skipping the relevance of psychological and psychosomatic components of suffering as well as the therapeutical role of the doctor-patient relationship, including hypnosis [67,85,86].

Lombroso studied and practiced hypnosis for over twenty years, published several articles and books on this topic and was a renowned professional in this field as witnessed by De Dubor [60], who also emphasized how helpful and effective was Lombroso's advice to use what he called reflex hypnosis. This Lombroso's technique is no longer used but might be interpreted as a smart form of indirect hypnosis leading to a resistant patient being involved. He often interpreted the results of his experiments with hypnotism in a wise a modern way, i.e.: a) the above-mentioned limits of the power of the hypnotist and subjects' resistance to disliked suggestions; b) the new abilities shown in hypnosis as a result of implicit learning; c) the need for specific suggestion to get physiological changes (such as heart rate); d) the role of imagination and brain cortex in perception. He also faced and reported odd phenomena conventionally pertaining to the field of parapsychology, like the induction at a distance performed by Janet with a truly scientific neutral stance, observing the phenomenon without prejudice and always inclined to find a rational, physical explanation without dismissing it a priori.

As a whole, Lombroso's ideas on hypnosis are sound and modern, despite affected by the ruling flaws on its interpretation at that time, such as the definition hypnosis as a sleep-like condition. His view was sounder and more modern than the wrong one of Charcot. Nevertheless, Charcot rightly remains an undisputed great father of modern neurology, despite his wrong theory of hypnosis – resulting from a strongly directive and egocentric approach leading to patient's manipulation [56]-while Lombroso has been derided. This reflects a double standard depending on a cultural filter: criminology and neurology are relevant topics of the mainstream medicine, while hypnosis is considered irrelevant at best. Furthermore, the professional profile of Lombroso was not limited to his theory and included anthropology, psychology and sociology, which permeated both his research and clinical practice.

When criminology is concerned, he strongly criticized imprisonment as a useful tool for inmates' reformation and considered it inhumane, reporting prisoners' complaints about injustice, loneliness and inutility of punishment, and preventing them to cope with social life following their release. He collected a wealht of testimonies of prisoners' complaints in his *Prison Palimsest*. Therefore, he strongly criticized the isolation model of jail and held a progressive system, where, after an

initial isolation, a progressive improvement of the inmate's condition was allowed up to release, according to their good behavior. He also proposed alternative warnings, like house-arrest, forced labour and fines, according to the severity of crime, and held the need for both prisons for life sentences and establishments for insane criminals [87].

In conclusion our data show the need for restoring the relevant but skipped aspect of Lombroso's figure, especially hypnosis, and overcome forever the limited, unfair icon of criminal atavism. Lombroso was a great physician-philosopher-anthropologist-hypnotist: not an unerring one anyway, but not worse than other men of the past, who have been celebrated as great scientist, forgiving their justifiable errors and wrong opinions. Indeed, the case of Cesare Lombroso has been the case mentioned by Marc Antony in his speech: "*The evil that men do lives after them; the good is oft interred with their bones; so, let it be with Caesar*" [88].

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