

Cosmotellurism in Lombroso's work

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Summary. *Background and aim of the work:* Few know that Lombroso was also involved in epidemiological research. In particular, Lombroso's scientific reflections on Medical Geography were addressed to the theme of climate influences and meteorological conditions on human conduct. The authors analyze the scientific production and the works of Lombroso devoted to medical geography. *Discussion:* Lombroso carried out accurate epidemiological investigations using the statistical method with great modernity, combining health data with geographical and climatic data to demonstrate the relationship between man, the environment and health in a social vision of preventive and curative medicine. *Conclusions:* The theory of Cosmotellurism in Lombroso's work is not only a source of unquestionable interest in the History of Medicine. The heritage of Medical Geography within the pre-bacteriological medical culture can continue with its teachings to correctly address the clinician's thinking even in the current historical context in which endemic and epidemic pathologies re-emerge in various parts of the world. (www.actabiomedica.it)

Key words: Lombroso, Medical Geography, Cosmotellurism, nineteenth-century's epidemiological research

1. Introduction

Within the variegated and ephemeral theories proposed by medical doctrine in the nineteenth century, the theory of Cosmotellurism is of relevance to the work of Cesare Lombroso.

This term (composed of cosmos and telluric) refers to factors relating to the physical environment such as, for example, climate, seasons, temperature, soil structure, agricultural production, and weather conditions.

In his extensive scientific production, the works devoted to medical geography are perhaps the least known.

The psychiatrist and criminal anthropologist, who became famous for his thesis of atavism (1, 2), totally repudiated and abandoned by the scientific community, had already taken a keen interest in this field of study at the beginning of his scientific career. In his volume *Studi per una geografia medica d'Italia*, (*Studies*

for a medical geography of Italy) published in Milan in 1865, Lombroso proposed a conception of health that was firmly grounded in data from regional nosographies (often with the aid of the historical method) and which took into account geology, atmospheric science, phytology and zoology (3, 4).

Lombroso's thought on the theme of the influences of climate and meteorological conditions on behaviour developed constantly throughout his scientific activity and is fully expressed in the volume *Pensiero e meteore. Studi di un alienista* (5, 6).

It should also be noted that, in the first two editions of the *Criminal man*, atavistic regression was not regarded as the only cause of crime (7-9). Indeed, Lombroso emphasized that this feature interacted with a number of other factors (such as occupation, age, education, nutrition and vices) including the urban environment and the climate (10), which favoured the re-emergence of primordial traits (11). Next to the

“internal” causes, innate or acquired (chronic alcoholism, head injury, diseases affecting the cerebrospinal axis), Lombroso identified “external” causes as climatic influences, along with dietary and social ones.

Of the climatic causes, the most important was considered a high temperature, while among social and dietetic causes, the most important was identified in alcoholic beverages. The preponderance of external causes determined a less serious delinquency and a possible correction, while that of internal causes generally determined a more serious crime and not susceptible to cure. In his decades-long research activity, Lombroso carried out accurate epidemiological investigations using a statistical method, combining health data with geographical and climatic data, demonstrating the relationship between man, environment and health, in a social vision of preventive and curative medicine (3-5). During this research, his attention focused on certain diseases such as cretinism, goitre and pellagra, demonstrating how a poor diet could favour them and make them proliferate (12).

On the basis of the importance attached to medical geography, he attempted to make statistical analyzes on the frequency of genius (that Lombroso believed was a condition closely connected to madness, as such as a manifestation of a same underlying organic regression), on the diffusion of certain diseases and on the propensity to criminal behaviors. He then correlated these with environmental and climatic conditions, in order to explain the clinical and pathological data (13).

Lombroso’s recognition of the action of geomorphological characteristics in the development of factors harmful to man was also reflected in his full adherence to the teachings of antiquity, as emerges from observations on the thought expressed by Hippocrates.

Hippocrates writes:

You will find that, in general, the appearance and manners of men conform with the nature of the territory. Where the land is fat, soft, rich in water, with very shallow waters (so as to be hot in summer and cold in winter), with a good climate, men will also normally be fleshy, without joints, humid, little inclined to fatigue and faint-hearted: they are prone to indolence and drowsiness; their limbs are obtuse, not thin and acute. Where the territory is bare, open, harsh, scourged by the winter and burned by the sun, you will find hard, dry, well-jointed inhabitants, tense

and hirsute; in their nature you will find capacity to act; as to character and temperament, they will be proud and independent in judging, closer to wildness than to meekness; with regard to the arts, they will be more acute and intelligent, better in war. And you will find that everything that lives in that territory will be similar to the territory (14).

Lombroso writes:

A marvelous passage that summarizes in a few words all the studies of Quételet, of Montesquieu, of Cabanis (5).

According to Lombroso, the influence of pathological factors on human health was therefore closely connected with the geography of the area, particularly the topographical conformation of the territory (mountainous, flat, hilly, desert), and with climatic factors (15).

Certainly, the foundation of this conception is based on a historically consolidated thought in medicine, i.e. that the environment consists of a set of interactions between physical-chemical conditions and living beings, interactions that characterize a specific area (16).

2. Towards an ecosystemic thought

This conceptual choice remained substantially intact for several centuries before acquiring a precise scientific foundation in the experimentalism of the nineteenth century, when positivism dominated in both science and in philosophy.

The term cosmotelurism has been almost completely lost today; in nineteenth-century medical geography, however, it enjoyed an almost unconditional consensus (16).

One of Lombroso’s undeniably original features is that, unlike the authors who had preceded him, he identified different “zones” in Italy; these he called “northern”, “southern”, “coastal” and “cosmotelluric” (divided into valley, volcanic, alpine and miasmatic areas). All these “zones” were characterized by the prevalence of different specific pathologies.

Lombroso also believed that “urban” areas should be regarded as autonomous and different from other areas, not only because they were the subject of more numerous and accurate studies, but also because of the presence of diseases that were less frequent elsewhere.

The conviction that the characteristics of the land influenced human physiology prompted the study of the composition of the land on which the various communities lived, since these characteristics were held to influence human and moral morphology.

Adherence to this concept led physicians to devote meticulous attention to mineralogy and chem-

istry and to study the composition and properties of soil and rocks and the transformations determined by the action of many natural and artificial factors. The importance attributed to the relationship between the quality of the land and certain diseases (17-20), particularly gastrointestinal diseases, was also highlighted by medical hygienists (21, 22).

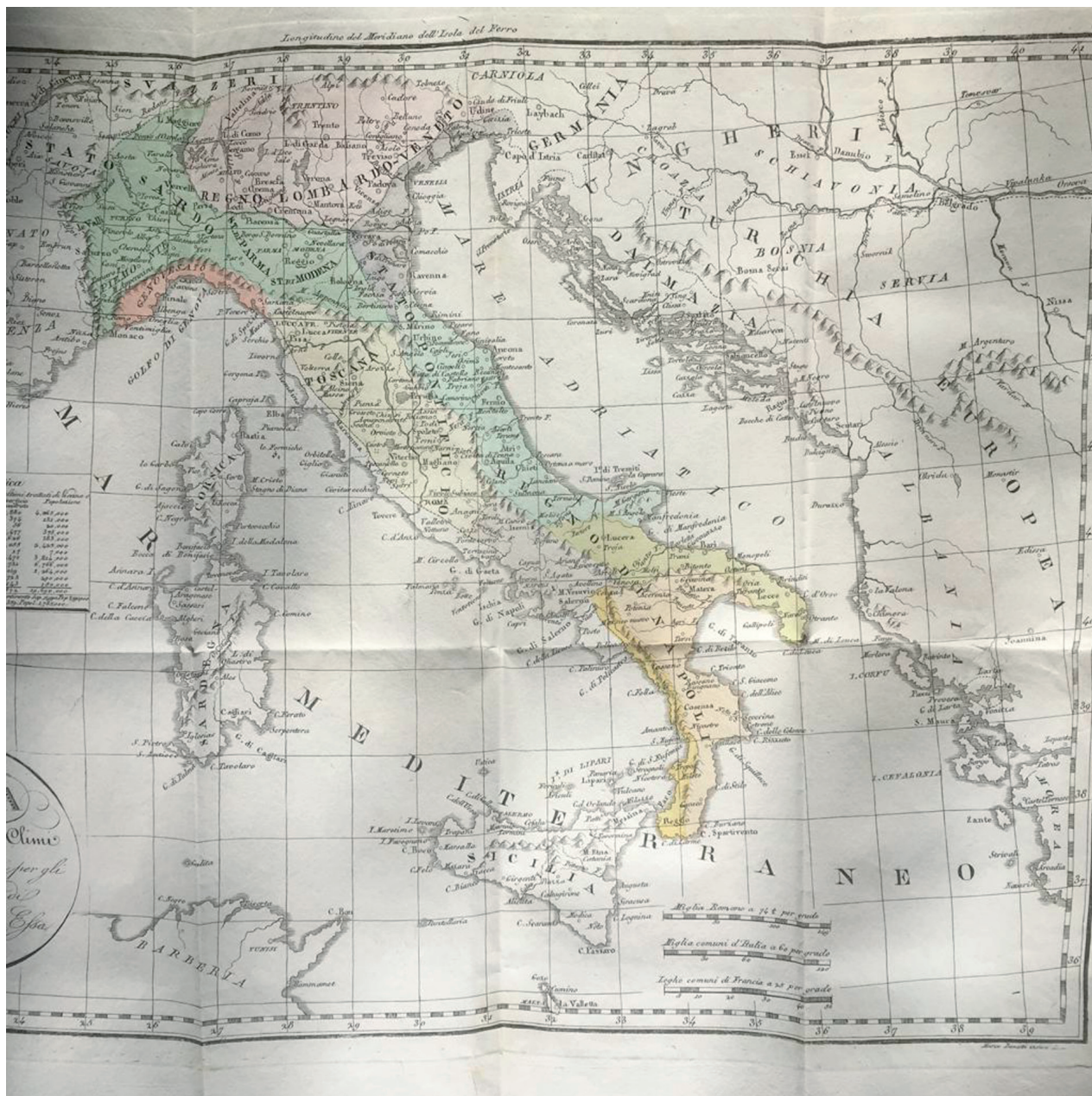


Figure 1. Climatological Map of Italy from the text of Giacomo Barzellotti, 1838. “Avvisi” agli stranieri che amano di viaggiare in Italia o dimorarvi per conservare o recuperare la salute. Vincenzo Batelli e Figli, “Firenze”

The conviction that climatic factors influenced human health had been part of medical doctrine throughout the centuries, and was further consolidated by the observations of commercial or colonial travelers and explorers in Africa, Asia and the Americas.

Reports from these journeys show that Europeans who were not accustomed to these areas fell sick in “hot lands”, while in “temperate lands” they did not run any health risks, except in the vicinity of stagnant water (23, 24). The so-called “cold lands”, high above sea level, did not pose serious risks for the visitor. Obviously, knowledge of infectious diseases and their etiology was still in an embryonic phase.

Lombroso argued that there was a need for statistical research, in order to draw a nosological map of Italy or, at least, to sketch its main lines. In particular, he underlined the persistent differences in diseases and their diffusion in the various regions of the country.

He showed that special areas, so-called, “unhealthy” could be identified in the various regions and that these were influenced by local factors. This was particularly true for the “cosmotelluric areas”, which were divided into valleys, volcanic areas, alpine areas and miasmatic areas.

As part of this research, and of considerable importance, especially for their socio-economic reflexes and the debates that followed, his studies on the endemic presence in various Italian provinces of cretinism, goitre and pellagra. Of the first two morbid forms, making use of observations begun in 1858 in Verona and continued with the examination of the subjects called to military service in Genoa, he identified the etiological relationship between the thyroid dysfunction, which was mainly dependent on water quality and the environmental and family factors.

He described the clinical characteristics of the diseases and indicated prophylactic measures, based on assumptions that would have proved to be scientifically unfounded.

As publicly stated by one of Lombroso’s pupil, this toxic-zeist interpretation of pellagra has, unfortunately, delayed the adoption of effective measures by the authorities, prolonging the pellagra epidemic in Italy and causing the appearance of many new cases, hospitalizations in asylum and deaths (25).

His conclusions were reported in the entry “Cre-

tinism” written for the Italian medical encyclopedia, including also elements of his by now begun studies of experimental anthropology (5).

With regard to the cosmotelluric areas, Lombroso observed a series of very specific infirmities in the valleys of the great Italian mountain chains, where “ozone, positive electricity” and light were scarce. The water that flowed down from the glaciers and gushed from the limestone rocks was often “stripped of carbonic acid and iodine”, but full of calcareous salts. In those valleys, rickets, goitre and cretinism abounded (16).

Very precise data on cretinism were available, and these were compared with those on goitre. What emerged was a singular parallelism between the two infirmities, with a notable difference in the diffusion of these disorders among the various regions.

In the northern part of Italy, Piedmont and Lombardy were the most affected regions; in the province of Florence, by contrast, these disorders were almost completely absent. What particularly emerged from the analysis of the data was the almost complete absence of sufferers in the islands, except for some localities in the interior and in mountain gorges. The most affected areas were the mountain villages of the Alps and Apennines, where a large number of goitres were recorded (26).

The geophysical characteristics that Lombroso considered particularly significant for water were permeability, heat absorbency, greater and lesser ease of drying, “toughness” and porosity.

With regard to the composition of the soil, it seemed important to distinguish the various types: granitic, clay, sandy, muddy, loamy and volcanic soil. Swamplands and some stretches of water were considered to have harmful effects. Clay mixed with drinkable water seemed to be detrimental to the health, as doctors had observed wherever people lived on clay soil, and not only in swampy areas.

In the mid-nineteenth century, issues concerning cosmotellurism were the subject of wide debate in life sciences.

In the opinion of physicians, malaria provided an example of the cosmotellurism theories summarized in medical geography. Indeed, its onset was closely connected with an extraordinary concomitance of factors related to air, temperature and soil composition.

Regarding “mal’aria”, the places where the disease occurred most frequently were investigated, as were their relationships with intermittent fever and the other manifestations of the disease.

After identifying the particular “unhealthy” areas of the various regions according to the presence of certain common factors, Lombroso drew up a so-called “food section”, which comprised diseases that arise from the misuse of specific foods (zea maiz or cactus opuntia and latyrus sativus) or drinks. Finally, he created an “ethnic section”, in which the forms and species that acquire particular diseases were grouped according to the characteristics of the country’s various populations.

Lombroso’s observations corroborated the studies of Giuseppe Sormani who had drawn up thermometric and demographic curves. Sormani had plotted the data on births and deaths in 15 areas of Italy and compared these with those on temperature and rainfall recorded by meteorological observatories in the same areas (27).

Schiaparelli’s demonstration of the effects of the moon on the barometer and on many other climatic characteristics led to the hypothesis that it could also influence the human organism in a more or less direct way (28).

Meteorology books proved to be a valuable source of data, though the analysis of isothermal lines required caution, since the large averages were figures that told the truth in their own way, to a certain extent and under certain conditions, but could not always be used to explain real cases.

It should be remembered that meteorology had dealt not only with the seasons and changes in the weather, but also with the influence of the stars, as Giuseppe Toaldo had pointed out a hundred years earlier (29). These orientations were then found in *Pensiero e meteore* by Lombroso and colleagues. Cosmotelluric knowledge thus gained impetus in the medical sphere.

3. Conclusion

Attentive to the health and anthropological issues that constituted part of his research activities in the early years of his career, Lombroso tackled the grave shortcomings of health and social organization. He

proposed public health interventions, such as draining swamps, canalizing rivers, promoting the cultivation of many lands, deforesting wooded areas near villages and roads, building ports, offering settlers better houses in the countryside and adopting a uniform system of sewers. Of course, as we have seen with regard to pellagra, we cannot ignore that some interpretations have also delayed economic-social reforms indispensable to the protection of the population health. Nevertheless, when we read those pages, we must bear in mind that they were written before the discovery of microbial agents, and it is not surprising that they contain many elements that would later reappear in the author’s best known psychiatric studies. Lombroso grasped the important differences among the various localities and regions of Italy, and was fully aware of the shortcomings of public health and the need for hospitals built according to updated criteria.

All these factors had a certain importance in the political and social field, as they marked an unsurpassed limit by the liberal state with regard to interventions that acted on private interests and were the starting point for social action in the name of hygienic prophylaxis (30).

In the analysis of Lombroso’s writings prejudices emerge against criminals, mads, primitive peoples and even women who are unacceptable and completely repudiated by science. However the theory of Cosmotellurism in Lombroso’s work is not only a source of unquestionable interest in the history of medicine. The heritage of medical geography within the pre-bacteriological scientific culture, can in fact continue with its teachings to correctly address the clinician’s thinking even in the current historical context in which, even after long periods of latency, endemic and epidemic pathologies re-emerge in various parts of the world.

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