



F2 An Evaluation of a Crime During a Trial in View of Cesare Lombroso's Scientific Insights on the 180th Anniversary of His Birth: This Scientist's Ideas Representing the Scientific Roots of the Evaluation of a Criminal's Personality Contained in the Italian Penal Code

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After attending this presentation, attendees will learn the scientific basis of articles in the Italian Criminal Code (Rocco Code, 1930) related to a criminal's personality, which originated from the Italian Positivist School (19th century) and from the ideas of Cesare Lombroso (1835-1909).

This presentation will impact the forensic science community by acquainting attendees with the introduction of Lombroso's insights into modern Italian criminal trials, which have led to the development of criminal jurisprudence related to neuroscience (e.g., the Bayout trial in Italy, 2010).

Lombroso's book *The Criminal Man* (1876) contains his insights, which are limited to the science of his times. A composite work, *The Criminal Man* collects nearly two decades of studies on criminals. These observations led Lombroso to the differential diagnosis among normal, insane, and criminal subjects (*Introduction to the Clinical Course on Mental Diseases*, 1863; *The Man of Genius*, 1864) and the formulation of an experimental research method in which criminal cases were included. For many years, Lombroso conducted research on the existence of somatic and cerebral brain abnormalities among criminals and the insane (*Some Cases of Lesions of the Central Nervous System*, 1861; *Supernumerary Cerebral Convolutions in a Murder and Satyrist*, 1871). After other contributions on such important cases of forensic psychiatry, like the Verzeni and Agnoletti murder trials (*Verzeni e Agnoletti studiati dal prof. Cesare Lombroso*, 1873) and the publication of *Anthropometry of 400 Venetian Criminals* (1872) and *Emotions and Passions of Criminals* (1874), Lombroso illustrated the correlation between somatic stigmata and mental deformities in reference to specific factors (atavism, epileptoidism). Lombroso saw illicit criminal behavior as an "organic fatality" that drew certain people to commit crimes. Following these ideas in the Italian penal code, articles were created to prevent criminal behavior through neutralization and control structures and by combining therapy with penal sanctions (e.g., Article 203, Italian Criminal Code).

Current research into the biological causes of crime has revealed such important legal and criminological aspects as genetics during trials and what is intended as a neurobiological explanation of criminal behavior. In fact, neuroimaging and brain imaging analyses (Computed Tomography (CT), Magnetic Resonance Imaging (MRI), **Positron Emission Tomography** (PET), and functional Magnetic Resonance Imaging (fMRI)) have shown reductions in the brain's structural and functional parts among subjects prone to violent behavior, leaving them unable to feel emotions and empathy, calling to mind Lombroso's morally insane. In fact, the necessity of assessing whether the criminal impulse is a possible adaptive response to the environment has been noted. The gene pool can be modified for "random variations" from which mutations can drift and "random changes" (genetic drift) migration influx. Indeed, mutations can be beneficial or detrimental with selection favoring the human ability to adapt and this has influenced evolution in the adaptive formation of new alleles. The offender's personality should also be added to these concepts. In fact, the offender's environment gives rise to his character as a result of the union between temperament (defined as the hereditary biological matrix), and the social/family context. As regards the environmental impact on one's body, epigenetics, which associates genes and environment, also regulates gene expression rather than the same gene's mutation. Another criterion concerns evolutionary influence on the brain's biology and structure. In genetics, the study of some alleles has enabled an understanding of the relationship between genetics and crime through the examination of such neurotransmitters as monoamines, including serotonin and dopamine, whose biological effects are regulated by enzymes: (e.g., Monoamine Oxidase (MAO) (MOA-L allele) and Catechol-O-Methyl Transferase (COMT)). Serotonin regulates impulsive-aggressive behavior and its alterations are the base of the aggressiveness; its alleles (including allele-s) determine a lower capacity for adaptation therefore generating aggressive behavior.

Because of Lombroso, the current Italian Criminal Code contains articles defining dangers to society (art. 203), attribution (art. 85), tendencies to commit a crime (art. 108), criminal recidivism (art. 99), and the habitual criminal offender (art. 102). Italian trial case reports related to Lombroso's observations have been used to illustrate all of this (Bayout trial in 2009, Albertani trial in 2011, and the Cremona trial in 2012).

Cesare Lombroso, Neurosciences, Criminal Law

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