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Book Reviews, Notes and Comments

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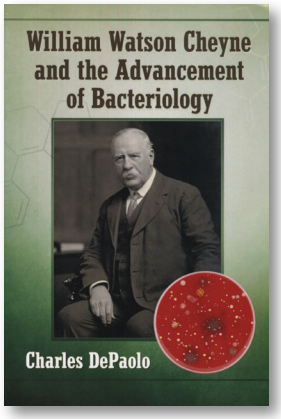

WILLIAM WATSON CHEYNE AND THE ADVANCEMENT OF BACTERIOLOGY
Charles DePaolo
Jefferson, North Carolina: McFarland & Co, Inc.; 2016.
270 p.
ISBN 978-1-4766-6651-8.
Also available as an ebook.
$ 39.95

CERVELLI DIVISI
L'evoluzione della mente asimmetrica
Lesley J. Rogers, Giorgio Vallortigara, and Richard J. Andrew.
Milano: Mondadori Education; 2016.
342 p.
ISBN 9788861844643.
€ 22,00.

[Divided brains: evolution of the asymmetrical mind]

The first healthcare revolution was the public health revolution and it has been told many times but this new book brings a new perspective by focussing on one person, and not one of the big names that have dominated the histories to this date. The revolution can be said to have started in 1854 when John Snow established the connection between polluted water and cholera, although the cholera bacteria were not identified until 30 years later by Robert Koch. One of the people who saw the importance of Koch's work was William Watson Cheyne who has received little attention by historians.

In 1873 Cheyne was spotted by Joseph Lister as a talented medical student and appointed his surgical "dresser", in 1876 he became his house surgeon in Edinburgh and then in 1877 went with Lister to London and supported that great man and promoted his work for the next fifty years. In 1914 when he was President of the Royal College of Surgeons he moved to the military hospital in Chatham and for the duration of the war promoted the principles of Lister in wound management, two chapters of this book describe "Listerism on the Battlefield". He continued to publish until 1927, when he was 75.

This excellent intellectual biography uses the life of a person who engaged in both medical practice and basic science to illuminate the interaction of basic science and clinical practice, and the stimulating impact of war on the development of a discipline and the transformation of medicine.

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Giorgio Vallortigara is one of the most celebrated behavioural neuroscientists in Europe, presently.

His co-authors are recognised eminences in the field of brain, behaviour and lateralisation. Vallortigara's creative approach was centred in different and rather diverse fields from dog tale shaking to chick fixed action patterns during development.

However, lateralisation represented his main and endurable scientific interest. The three-signature book therefore enlists brains and asymmetrical behaviours, the function, evolution, development, causation and finally applications and future directions of the lateralisation science.

In this well-written and exhaustive book, whose narration flows fruitfully page after page, a few issues raised our attention and the one of our young students. And we will enlist them for the biomedical reader given the specific interests of the readership of our *Annali ISS*.

"VEN" neurons and emotional aspects in the hemispheres (page 199). In both apes and human primates, the *Von Economo* (VEN) neurons reflect associated needs in the use of social signals. VEN neurons are more numerous in the cortex of the right cingulate and are influenced by a very wide range of emotional states (sense of well-being, negative emotions and risk-taking). Some structures of the right hemisphere (for example the amygdala) are particularly involved in triggering emotional states; later, mechanisms of the left hemisphere will modulate the following steps. Despite a variety of both anecdotal and peer-reviewed papers, no dichotomy exists between the right and left hemispheres as far as positive and negative emotions are concerned, but rather an initial preference in the elaboration of emotions by one hemisphere and a consequent re-elaboration of

meaning by the other side. This is very interesting in behavioural patterns concerning "fun and laughter", risk-taking and gaming behaviour.

Evolution of the language as a continuation of the motor skills (page 122). The initial function of the left hemisphere in the control of manual action has evolved into gestural language first and then evolved into verbal language. The left hemisphere is involved in routine behaviours (familiar *vs* novel *stimuli*) and therefore specialized in social communication, hence in current human verbal language. In humans the posterior area of Broca (area 45) is involved in linguistic tasks and also in the capability to build and use instruments; in macaques, on the other hand, the corresponding homologous area consists of a large number of "mirror neurons". In chimpanzees there are no comparable population asymmetries for area 45, demonstrating that the evolution of vocal language remains a prerogative of human primates.

Coevolution of language and social structure in human beings. The type of social structure could explain why some species are able to "communicate" by means of words (parrots and human primates), while other animals are unable to do so (anthropomorphic apes). A very complex social structure based on the association of long-term pairs has favoured the evolution of vocal identifiers of "couples", families and larger social groups. The lateralization of language control in the left hemisphere may have co-evolved with a certain number of stages of human evolution, yet more precise reconstruction is presently very difficult due to the scattered fossil record. When manual gestures with their intrinsic property of clear reference to intentions and specific means to achieve them, became central in human communication, the area of Broca in the left hemisphere inevitably became more complex and the identification of speech identifiers would provide an ideal solution.

Individual asymmetries and asymmetries population in a social group (page 77). The well-known evolutionary biologist John Maynard Smith (also regularly involved in a variety of outreach activities) explains how aligning the direction of behavioural asymmetries in a population, springs up as an "evolutionarily stable strategy". Initially, individuals would lateralize themselves at an individual level, then they would align the direction of their asymmetries when they began to interact in ways that made their asymmetry relevant to mutualistic behaviour. Such a hypothesis suggests the existence of "social bonds" forcing individuals to align their asymmetries with those of the other subjects within their own social group.

Hormonal and experience-caused effects on lateralization (page 171). Lateralization can be modulated by the interaction between endogenous hormones and individual experiencing. The way hormones act to intensify attack and copulation in young chicks is by disinhibiting control of the right hemisphere from the aggression and copulation responses from the inhibition exerted by the left hemisphere, shifting the hemispheric dominance from the right. This dominance is smaller or greater depending on the development phase of the single individual exposed to the particular social experience.

As a whole, this book enlists important and culturally relevant topics. It is therefore highly recommended in the bookshelf of students, professional and physicians in the neurological and psychological social areas.

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