

## BOOK REVIEWS, NOTES AND COMMENTS

Edited by

**Federica Napolitani Cheyne**



### **L'ESTASI FARMACOLOGICA Usò magico-religioso delle droghe nel mondo antico**

Paolo Nencini

Roma: Giovanni Fioriti Editore;

2014. 238 p.

ISBN: 978-88-95930-96.1.

€ 26,00.

*[Pharmacological ecstasy. Ritual-religious uses of psychotropic drugs in the ancient world]*

This book, following those by the same author on opium [1] and alcohol [2], completes a trilogy devoted to the historical, sociological, cultural and anthropological aspects of the development of different drug uses from prehistoric times to the present. Much of this work debunks several time-honoured narratives showing, for example, that ritual/religious and therapeutical uses of opium started a long time before its hedonic uses.

This third instalment is a significant contribution to the understanding of a variety of phenomena in the realms of psychology, psychopathology, and either therapeutical or non-therapeutical psychotropic drug uses. Among other things, the evidence discussed is often against the frequent attribution of a significant role of drugs in the development of various religions as distinct, *e.g.*, from shamanic, magic, or today's New Age practices. At most, drugs may have favoured group cohesion in religious practices and/or facilitated the performance of one or the other ritual. The discussion of the possible role of drugs and its frequent discounting helps understanding the considerable differences between shamanism, magic and wizardry, between Greek mantic (pythonic) practices and Roman divinatory practices, between Jewish prophetism and Christian symbolism, and so on and so forth.

In this difficult exercise the author had to negotiate a monumental amount of highly heterogeneous literature evidence. In fact this field, characterized by a heterogeneous nomenclature – psychedelic, psychotomimetic, psychodisruptive or hallucinogenic drugs – is much wider and diversified than those of opiates and alcoholic beverages. This depends on the wide variety not only of different drug types (rather than different forms of the same type of drug), but also of different settings in which their use was developed.

Having to deal with various states of altered consciousness, the author devotes his first chapter to a clear survey of the present controversial knowledge on consciousness and its “normal” and “altered” states (see also the recent series of articles in this journal on coma and vegetative states, *Ann Ist Super Sanità* 2014;50(3):207-

266). Quotes are justified by the infinite variety of different approaches and theories: to the point that the author has felt the need to discuss (and reject) the opinion that “altered” states of consciousness simply do not exist, being extremes in a continuum of “normal” states. In this context it should also be noted that recent times have witnessed an exponential increase of more or less fanciful accounts of Out-of-body experiences and Near-death experiences [3] (these are briefly discussed in a later chapter, p. 177), resulting in several attempts to provide scientific explanations of such experiences [4].

Additional complications stem from the fact that this field is strewn with a startling number of chicken-and-egg questions for which answers are mostly unavailable (and will remain unavailable), due to the absence or unreliability of prehistorical and historical evidence. For example, euroasiatic or indoamerican shamanic experiences may have originally developed *without* the use of drugs, *i.e.*, by steady introspection, intense physical exertion (dance etc.) and/or stunning sensory stimulation (obsessively rhythmic music or drum beating); only later on, drugs may have been introduced as facilitators. With or without drugs, the importance of the shaman's functions is further confirmed by recent developments such as the taking on of a political role in defence of amerindian communities from external threats [5].

The second chapter, devoted to the Palaeolithic Age, is a good example of how the admixture of available and missing evidence can unleash a host of equally (or almost equally) credible accounts and hypotheses in contrast with each other. For example, the role of drugs – particularly plants containing antimuscarinics such as atropine and scopolamine – in the production of Franco-Cantabrian paintings (Altamira, Lascaux, etc.) is strongly supported by some but firmly denied by others. Earlier interpretations were often based on an instrumental (“intercession”) model – the invocation of animal spirits to favour success in hunting, including defence from dangerous neighbours, and to stave off the spectre of famine. Incidentally this seems to anticipate innumerable similar phenomena both religious and non-religious, till recent times, like the cult of the Fourteen Intercessor Saints at the spectacular baroque *Vierzehnheiligen* pilgrimage church in Bavaria.

Subsequently, more sophisticated, often “cognitive”, hypotheses have been supported and Nencini shows how each has its pros and cons, including those involving the use of drugs. Of special interest in the face of present debates on neuropsychological and psychopathological questions are a “neuro-aesthetic” hypothesis and an “autistic” hypothesis. The latter is based on the sudden appearance in the Paleolithic of a high quality artistic capability, assuming that such an apparently rapid flowering is not an artifact due to missing evidence on previous more “primitive” attempts: the

franco-cantabrian sudden perfection could therefore be compared to the sudden emergence of a high-quality drawing capability in some autistic children, without any previous *ad hoc* training. The substantial implications for the relationships between the development of language and other cognitive capabilities by *Homo sapiens* are too complex to be discussed here.

For obvious reasons, the contents of the following six chapters cannot be discussed in detail. The third one concludes in favour of marked differences between the experiences of Middle-east neolithic populations, whose use of drugs was likely limited to beer (quite murky and with a low alcohol contents, therefore consumed more for its food value than for its inebriating properties), and those of the central and western european areas, where ample evidence has been found of an extensive use of opium; however, for ritual and perhaps therapeutic purposes, not for hedonic purposes. The fourth chapter deals with subsequent developments in the East, including the spread of cannabis domestication and uses (there is evidence of its presence in China already around 4,500 BC) and of shamanic uses of *Amanita muscaria* in the northeastern euroasiatic area. Quite interesting in this chapter is a discussion of the more or less fanciful attempts to guess what was the mythical Vedic ritual drink Soma, of importance among the early Indo-Iranians, for which different investigators have “identified” some 20 different plants and fungi with quite different psychotropic properties.

The fifth chapter confronts scientific evidence and legendary accounts concerning Mediterranean areas up to and including the period corresponding to the Homeric poems; *i.e.*, ranging from the sudden appearance, at the end of the second millennium BC, of iconographic representations of the opium poppy in Minoic territory to Circe’s wizardry and its neutralization by appropriate antidotes (and here we have the first appearance of the term *pharmakon*, but meaning poison, not medicine). The following chapter is focused on archaic and classical Greece, with its wide range of divinatory (mantic) practices often intertwined with medical-therapeutical practices (iatromantic); and again, the experts often disagree concerning the role of various drugs and (in the case of Delphi’s Pythia) of toxic fumes (but the author shows how most of this “evidence” has to be discounted in the face of harder data).

Chapter VII, on mystery rites and religions, offers a fascinating analysis of the way in which drug factors interact with a setting of social, cultural, psychological and philosophical factors (*e.g.*, Plato’s “enthusiasm”) in the production of altered states of consciousness. The specific functions of one or the other drug are again controversial, except for the firm evidence provided by the many representations of the opium poppy, combined with corn ears, in relation to the Demetra cult in the Eleusinian mysteries; *i.e.*, rites in which fertility, death, and regeneration/rebirth are strictly connected as a reflection of the annual agricultural cycle (the influent Plato, incidentally, was a firm believer in metempsychosis). As shown also by the Greek myth of Persephone’s abduction by the King of the Underworld Pluto (in the Roman version Proserpina and Dis, re-

spectively) and by “competing” myths (particularly the one resulting in Orphic mysteries), descent to, and return from, the Underworld is a crucial aspects of these cults, be they associated or not with one or the other type of drug use.

The last chapter is an effective overview of the developments from ancient times to the present, showing the complex relations in the Middle Ages between different trends – the Neoplatonic, Hermetic and Gnostic heritages, Scholastic philosophy and theology appropriating Aristotle’s wisdom, astrology and alchemy, and last but not least, wizardry with its use of drugs (particularly those with central antimuscarinic effects) and its long history of persecution of not-sufficiently-submissive women (overall, about 100,000 trials, up to 90% of all trials in some places and periods). The following step deals with the apparently bizarre admixture in the Renaissance of currents like esotericism and the new paradigms of modern science: Paracelsus’ pharmacology and therapeutics is the classical example of such a hybridation. This long story ends with a confrontation between modern scientific psychopharmacology and “New age” trends with their religious dogmas connected to the use of hallucinogens and their philosophies which appear to come much closer to the Gnostic than the Hermetic tradition – both signs of a strong nostalgia for an (imaginary) past Golden Age.

The author concludes his analysis with a harsh judgment on the drastic prohibition – following the Timothy Leary Harvard “scandal” and Leary’s jailing in the sixties, another example of the 20th century fixation with witch hunting, shortly after the downfall of Senator McCarthy – of any use of hallucinogenic drugs in psychological and psychopathological research, including investigations on their therapeutic potential in some psychiatric conditions. Here the author forgets to mention the work by one of the pioneers in this field, the Italian psychoanalyst Emilio Servadio (1904-1995), who experimented LSD and psilocybin on himself and on younger colleagues in training with him (without any “religious” freak like those of Leary and others), and gave lucid accounts of the effects of the drugs (see [6] for his biography and bibliography).

Finally, the last few pages of the volume are devoted to a useful synthetic illustrated atlas providing information on the characteristics and properties of 24 plants and fungi – from *Amanita muscaria* to *Withania somnifera* – endowed with psychotropic properties. The reviewer must duly note the absence of an index, a “luxury” obviously beyond the means of an otherwise meritorious small publisher.

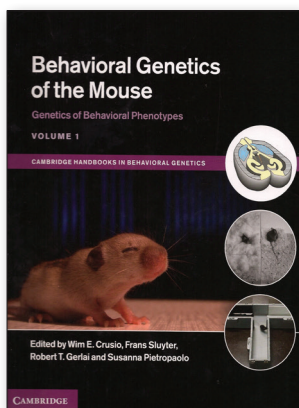
At this point, our few readers must have understood that the perusal of this book is no gratis lunch; but please remember, “For every complex problem there is an answer that is clear, simple, and wrong” (Henry Louis Mencken).

## References

1. Nencini P. *Il fiore degli inferi. Papavero da oppio e mondo antico*. Roma: Franco Muzio Editore; 2004 .
2. Nencini P. *Ubriachezza e sobrietà nel mondo antico. Alle radici del bere moderno*. Monte San Pietro:

- Gruppo Editoriale Muzio; 2009. Reviewed by G. Bignami in: *Ann Ist Super Sanità* 2010;46(1):101-3.
3. Gottlieb R. To Heaven and back! *The New York Review of Books* 2014; 61 (16):75-77.
  4. Gottlieb R. Back from Heaven – The science. *The New York Review of Books* 2014(17):36, 38.
  5. Shepard Jr. G.H. The voice of the shaman. *The New York Review of Books* 2014; 61(17):50-2. Book review of Kopenawa D, Albert B. *The Falling Sky: Words of a Yamomami Shaman*. Cambridge (MA, USA): Bellknapp Press/Harvard University Press; 2013.
  6. Emilio Servadio. [http://www.emilioservadio.it/joomla/index.php?option=com\\_content&view=article&id=47&Itemid=53](http://www.emilioservadio.it/joomla/index.php?option=com_content&view=article&id=47&Itemid=53)

Giorgio Bignami  
 già Istituto Superiore di Sanità, Rome, Italy  
 welin.bignami@mclink.net



**BEHAVIORAL GENETICS OF THE MOUSE**  
**Genetics of Behavioral Phenotypes. Volume 1.**  
 Wim E Crusio, Frans Sluyter, Robert T Gerlai, Susanna Pietropaolo (Eds). Cambridge, UK: Cambridge University Press; 2013. 376 p. ISBN: 9781107034815. \$ 155.00. (Cambridge Handbooks in Behavioral Genetics).

Behavioral genetics, as a field of study examining the role of genetics in animal behavior, has been strongly facilitated by the recent advances in genetic engineering, allowing scientists to directly manipulate genetic material in whole animals and to observe the effects of such manipulation on behavior. The advantages of the use of mice for behavioral studies are well-known (Bucan M, 2002). Together with their elaborate behavioral repertoire (often sufficient to be translated to human behavioral contexts), the possibility to easily create different mutant strains and “knockout” mice made these animals the primary model for genetic human neuropsychiatric diseases (Churchill GA, 2004; Pierce JL, 2004).

The studies focused on mouse behavioral phenotyping, not only require appropriate ethological observations, but also need a sound knowledge of any single animal model, and this last point seems to be the core and the strength of this interesting book.

*Behavioral Genetics of the Mouse* is the first volume of the “Cambridge Handbooks in Behavioral Genetics”, edited by Wim E Crusio, Frans Sluyter, Robert Gerlai and Susanna Pietropaolo, scientists with a solid background in behavioral and genetic neuroscience.

The book is definitely a handbook for the way it is arranged and structured. It is divided in various sections, from perception to social behavior, each single section containing different chapters with short paragraphs and summaries somehow similar to review articles.

The book starts from the Section 1 (General) listing basic concepts, such as the description of mouse ethogram, where the authors describe the common behavioral repertoire of the mouse in different social and non social contexts and discuss on the impact of the introduction of automated systems of analyses (however many behavioral biologists still doubt that fully automated systems will easily substitute the performances of a well trained and expert human observer). Of course, the ethogram scales here proposed represent a rather simplify and low-cost time saving methodology since the mouse species is reportedly highly sophisticated in term of intraspecific (and sex and age dependent) social bonding (Alleva E, 1993; Alleva *et al.*, 1995). However, this subset of behavioral scores is enough to provide to the inexperienced fellows a sufficient amount of basic information.

The second Section (Perception) is fully dedicated to all aspects of perceptual system with specific chapters focusing on sight, hearing, touch, olfaction and taste, while Section 3 (Autonomous and motor behaviors) appears more heterogeneous, ranging from adequate methodology to assess neurodevelopment in mouse pups (Chapter 11: Reflex development, Chapter 17: Genetic influences on infant mouse ultrasonic vocalizations) to mouse models of stress-induced depression-like behavior at adulthood (Chapter 19: Mouse models of stress-induced depression-like behavior: stress vulnerability and antidepressant response as traits). The concepts described in these two sections are fundamental for the correct planning and design of the behavioral tests and for the proper understanding of the results. For instance, a dysfunction of the auditory system could represent a confounder in learning and memory tasks where the mouse has to respond to acoustic stimuli. Interestingly the book includes also numerous examples of experimental problems really useful for naïve researchers to solve their potential troubles.

The last two sections analyze the social behavior and the learning and memory performances in different ways. The purpose of the social behavior section is well explained by the authors: “Genetic approaches have also emphasized the necessity for understanding how contemporary laboratory mice have evolved from their wild ancestors and the degree to which specific aspects of their physiology and behavior may or may not represent the characteristics of those ancestors”.

The learning and memory section reviews current knowledge about several tests and paradigms, from latent inhibition to object recognition, usefully guiding the reader towards the most important studies concerning these tasks.

An interesting and original feature of this book is that each chapter is introduced by a short paragraph offering an historical overview to the reader. At this purpose, the first chapter “Behavior genetics: Where do we come from and where are we going?” by Wim E Crusio and Robert T Gerlai, describes the interaction between ethology and genetics, and the need of this interplay to understand the key



role of the genes in regulation the behavioral response. Today, with the increasing availability of genetic mouse lines, many still consider the behavioral genetics to be a young field, while as the authors of the first chapter explain, one could regard Francis Galton (1822-1911) as the first behavioral geneticist. They continue by saying that one of the more explicit signs of the birth of behavior genetics as a separate of scientific field is represented by Hall's seminal chapter on psychogenetics in Stevens' *Handbook of Experimental Psychology* (1951). The presence of historical notes makes this book something more than a basic handbook, revealing perspectives which one reflect in the history of the various methodologies.

In conclusion, *Behavioral Genetics of the Mouse* represents a good effort to implement the knowledge of mouse behavior and a good guide for both students and senior researchers. To have a complete overview of the current state-of-the-art in behavior genetics we wait for next two volumes that will be dedicated to mouse models for neuropsychiatric disorders and to different behavioral tests.

### References

1. Alleva E. Assessment of aggressive behavior in rodents. In: PM Conn (Ed.). *Paradigms for the study of behavior. Methods in Neurosciences*. vol.14. New York: Academic Press; 1993. p. 111-137.
2. Alleva E, Petruzzi S, Ricceri L. (1995). Evaluating the social behaviour of rodents: laboratory, semi-naturalistic and naturalistic approaches. In: *Behavioural Brain Research in Naturalistic and Semi-Naturalistic Settings*. Enrico Alleva, Aldo Fasolo, Hans-Peter Lipp, Lynn Nadel and Laura Ricceri (eds), Kluwer, Dordrecht, The Netherlands, pp. 359-374.
3. Bućan M, Abe T. The mouse: genetics meets behavior. *Nat Rev Gen* 2002;3:114-23.
4. Churchill GA, Airey DC, Allayee H, Angel JM, Attie AD, Beatty J, *et al.* The Collaborative Cross, a community resource for the genetic analysis of complex traits. *Nat Gen* 2004;36: 1133-7.
5. Hall CS. The genetics of behavior. In: Stevensen SS (Ed.). *Handbook of Experimental Psychology*, 1<sup>st</sup> ed. New York: John Wiley and Sons; 1951. p. 304-29.
6. Peirce JL, Lu L, Gu J, Silver LM, Williams RW. A new set of BXD recombinant inbred lines from advanced intercross populations in mice. *BMC Genet* 2004;5:7.

Caterina Michetti  
Istituto Superiore di Sanità, Rome, Italy  
caterina.michetti@iss.it

### Addendum: A brief historical note

The four editors of this textbook have had rather and regular contacts with our Institution (ISS, Rome). Crusio gave important contributions on Roman High-Avoidance and Low-Avoidance rat strains, (RHARLA), originally selected at ISS by Giorgio Bignami (1, 2). Recognizedly, behavioural genetics was pioneered in the laboratory run by Daniel Bovet for over 30 years at Iss.

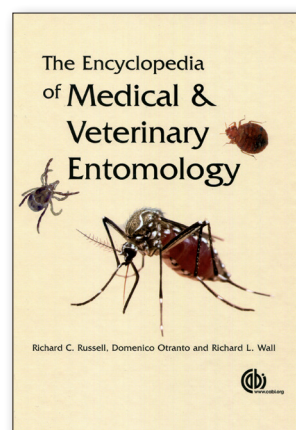
Much more recently, in September 1994, the Iss organized a Nato School in Maratea (Pz, Italy). This was operation-

ally acted by Luigi "Gino" De Acetis, a former ISS technical assistant in Bovet's group and by ISS tenured-staff researcher Laura Ricceri: both enrolled in the Laboratory of Organ and System Pathophysiology, founded by Amilcare Carpi de Resmini and subsequently headed by Giorgio Bignami (for the latter, see above).

Book editors Wim Crusio and Frans Sluyter participated in this Maratea event, the former organising an original "mossy fibers café" (3, 4). Book editor Susanna Pietropaolo, now tenured staff as Researcher at CNRS in Bordeaux (France), was both undergraduate student at ISS (jointly-supervised by Igor Branchi and myself) then received a Phd at the Zurich ETH (I sat in her thesis committee).

1. Bignami G. Selection for high rates and low rates of avoidance conditioning in the rat. *Anim Behav*. 1965;3(2):221-7.
2. Bignami G, Bovet D. Selection experiment with respect a conditioned avoidance reaction in the rat. *C R Hebd Seances Acad Sci*. 1965;25;260:1239-44.
3. Shenk F. Behavioural brain research in natural and semi-natural settings (News & comment). *Trends Ecol Evol*. 1995 ;10(5):184-186.
4. Alleva E, Fasolo A, H.-P. Lipp H-P, Nadel L. (Eds). *Behavioral Brain Research in Naturalistic and Semi-naturalistic Settings: Possibilities and perspectives 158-179. The Hague: Kluwer Academic Publishers, 1995.*

Enrico Alleva  
Istituto Superiore di Sanità, Rome, Italy  
enrico.alleva@iss.it



### THE ENCYCLOPEDIA OF MEDICAL & VETERINARY ENTOMOLOGY

Richard C Russell, Domenico Otranto, Richard L Wall. Wallingford, Oxfordshire, UK: CABI; 2013. 429 p. ISBN-13: 9781780640372.

This *Encyclopedia* represents the work of three outstanding entomologists: Richard C. Russell of the University of Sydney, Domenico Otranto of the University of Bari, and Richard L. Wall of the University of Bristol. It has been structured within the "One health" concept to support physicians and veterinarians in the common effort to control human and animal infectious diseases which are frequently interconnected. In the last decades, medical and veterinary entomology is assuming

an ever great importance due to the new challenges caused by the global increase and spread of arthropods, which, apart from their role as pathogens for humans and animals, are vectors of many bacterial, parasitic, and viral diseases, some of which are pandemic. The passive introduction of arthropods by travelers, by trade of goods and animals, and the global warming are the main factors that have contributed to the increased importance of arthropods in human and animal medicine.

This *Encyclopedia* represents a scientific and rigorous work presented in an educational way.

The book structure guides the reader into the wide and complex world of arthropods, which comprise about 80% of all known species of animals. There are two introductory chapters. The first chapter deals with what are medical and veterinary entomology and what are the arthropods (phylum Arthropoda) and their classification: 1. class Chilopoda (centipedes), Diplopoda (millipedes), Arachnida with the subclass Acari (mites and ticks), Scorpiones (scorpions), order Araneae (spiders), and other orders of minor or incidental interest; 2. the class Insecta with the order Blattodea (cockroaches), Phthiraptera (lice), Hemiptera (bugs), Coleoptera (beetles), Hymenoptera (ants, bees, wasps), Lepidoptera (butterflies moths), Siphonaptera (fleas), and Diptera (two-winged flies). The second chapter is focused on disease transmission, allergic reactions, direct damage, entomophobia and delusional parasitosis, forensic entomology, and emerging issues of arthropods. The core of the book are the 36 chapters dealing with different arthropod groups, namely ants, bed bugs, bees and wasps, beetles, biting midges, black flies, blow flies and screw-worm flies, butterflies and moths, centipedes, cockroaches, eye flies, fleas, flesh flies, horn flies, horse flies, house flies and other non-biting flies, human bot flies, keds and louse flies, kissing bugs, chewing lice, sucking lice, millipedes, mites, mosquitoes, nasal bot flies, non-biting midges, sand flies, scorpions, spiders, stable flies, stomach bot flies, hard ticks, soft ticks, tsetse flies, tumbu flies, and warble flies. Each of these chapters is structured in eight sections (introduction,

taxonomy, morphology, life cycle, behavior and bio-nomics, medical and veterinary importance, prevention and control, and a selected bibliography). An alphabetical index completes the *Encyclopedia*. Most of the chapters are accompanied by black and white figures (138 in total) which show the arthropod structure for their identification in an educational way. In addition, there are 64 color plates which show larval and adult stages of arthropods in their environment or in laboratory conditions.

Arthropods of special importance in human and/or animal medicine are covered more extensively: black flies (Simuliidae), the vectors of human filariasis, blow flies and screw-worm flies (Calliphoridae), the etiological agents of myiasis, fleas (Siphonaptera), the vectors of the bubonic plague, mites (Acari), the causative agents of allergies, mosquitoes (Culicidae), the vectors of viral (e.g., yellow fever, dengue, Japanese encephalitis, West Nile, chikungunya) and parasitic (e.g., malaria, filariasis) diseases, sandflies (Psychodidae), the vectors of *Leishmania* and arboviruses, and ticks (Ixodidae and Argasidae), the vectors of Lyme disease, tick-borne encephalitis, Siberian tick typhus, Crimean-Congo hemorrhagic fever, rickettsiosis, ehrlichiosis, babesiosis, among others.

The *Encyclopedia* is a useful tool for the non-specialists (e.g. medical and veterinary doctors, biologists, epidemiologists, agronomists, ecologists, farmers, students) who want to learn more about arthropods of medical and veterinary importance. Since the reader of this *Encyclopedia* could also be interested in how these vectors/pathogens can be identified, the inclusion of dichotomous tables, at least for the arthropod taxa of major importance, would have been very useful. Furthermore, the inclusion of a scale bar in all figures, and of a list of websites where the readers could gather more information, could be envisaged in a future edition of the book.

Edoardo Pozio  
Istituto Superiore di Sanità, Rome, Italy  
edoardo.pozio@iss.it