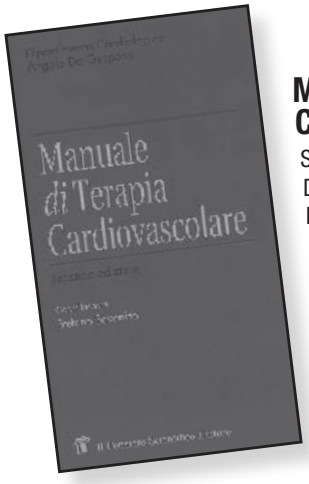
Book Reviews, Notes and Comments/ Recensioni, Commenti e Segnalazioni

A cura di
Federica Napolitani Cheyne



Manuale di Terapia Cardiovascolare

Stefano Savonitto (coordinatore). Dipartimento Cardiologico Angelo De Gasperis. Ospedale Niguarda Ca' Granda, Milano. 2.ed. Roma: Il Pensiero Scientifico Editore; 2006. 1000 p.
ISBN 88-490-0055-3.
€ 85,00.

We are very pleased to welcome the second edition of the *Manuale di Terapia Cardiovascolare* coming from the Cardiac Department of the "Ospedale Niguarda Ca' Granda" in Milan. This volume written by 81 authors under the wise supervision of Stefano Savonitto shows immediately all the "ingredients" to overcome the already considerable success of the first edition published in 2002.

Many things have changed over the last four years in the treatment of cardiovascular diseases. New therapeutic strategies mainly in the pharmacological and interventional fields have been validated and consolidated in clinical practice. Surgical procedures of already proved efficacy have become safer allowing expansion of indications for surgery to sicker and older patients. With the development of international guidelines the decision making process has progressively moved from a medicine based on clinical experience and general knowledge to the evidence based medicine. In this rapidly changing scenario an updating of the original text was absolutely expected and opportune.

Many integrations have been added to the heart failure section. A new chapter on the diastolic dysfunction gives us a relevant cultural tool for a full understanding of physiopathology in very complex clinical conditions. All the aspects of heart failure treatment have been exhaustively debated and the role and the indications of conventional surgical procedures in alternative to heart transplantation have been addressed, including surgical strategies for functional mitral regurgitation.

Deep revision and updating have been made in the sections related to coronary revascularization and surgical treatment of heart valve diseases. Among the several useful and stimulating new chapters (treatment of arrhythmias in paediatric patients, heart disease in diabetic patients, treatment of pulmonary hypertension, etc.) we have found of particular interest the section regarding the risk assessment for cardiac surgical procedures: in the present days as different therapeutic strategies can be offered to the same clinical condition, a continuous cultural exchange between cardiologists and cardiac surgeons is mandatory to optimize treatment of our patients.

The wide number of the subjects covered, the great attention to the scientific literature and to the international guidelines do not weaken at all what is in our opinion the original "spirit" of the manuscript: to give us in a handbook format the practical and qualified experience of 40 years of team work in the battle against cardiovascular diseases. Interdisciplinary team work is a very well structured and consolidated set-up in the "De Gasperis" Department since its foundation. This strong believe in the need of a team effort to achieve the best possible clinical results comes out from the manual both in the number and variety of authors (we find not only cardiovascular specialists but also diabetologists, pneumologists, neurologists, haematologists etc.) and in the style used. The simple and synthetic approach to very complex clinical problems reflects the original practical aim of the book and the successful intention to address a wide target of readers, not only hospitals specialists but also and above all cardiologists of territorial services and general practitioners. This with the aim of a continual communication between hospitals and primary care services which is one of the key components of modern medicine and has always been in the Niguarda Hospital's cultural and clinical tradition.

This remarkable synthesis between scientific knowledge and four decades of practical experience from a large public hospital coming from our colleagues and friends of the Cardiac Department of the "De Gasperis" hospital is a true great contribution to our every day clinical practice.

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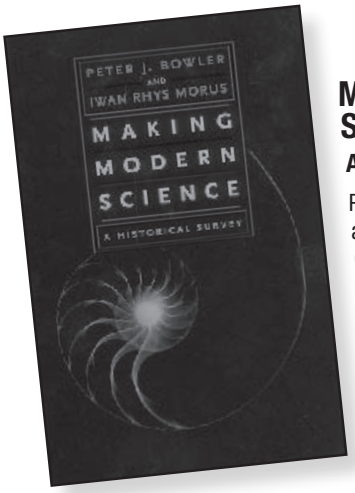

Making Modern Science

A historical survey

Peter J. Bowler
and Iwan Rhys Morus.
Chicago: The University of
Chicago Press; 2005. 464 p.
ISBN 0-226-06861-7.
US$ 25,00.

From Galileo, Descartes and Newton to Lovelock's Gaia living planet. From the modern "Scientific Revolution" of the XVII century to environmentalism, ecology and human sciences. From the laws of classic causality to Einstein's curvature of space-time, and to Heisenberg's principle, which introduces uncertainty as an unavoidable component of scientific knowledge. As announced in the title, this book is a historical survey on modern science presented as a series of narrations, which explain the development of those disciplines usually referred to as science.

A key merit of the book is the pleasure of entering into the stories, which are reported with accuracy and outstanding clarity. Each chapter contains an overall picture of how the theme has been covered by different historians and different points of view. The result is not only a very readable book, but also a resource that provides an excellent bibliography for each chapter.

This is the answer to an explicit need: a textbook of the history of science to be used by first-year undergraduates. The authors are experienced teachers of science history and the first draft of many chapters received positive feedback from students – assuredly an indicator of the book's clarity.

The book is divided into two parts. The first part is dedicated to the most important scientific developments of the modern era (episodic chapters): from the XVII century – the beginning of the "scientific revolution" – to the present, including the Chemical Revolution, the Darwinian Revolution, Genetics, and Twentieth-Century Physics. The second part presents thematic chapters that concern the relationship of science with issues such as religion, technology, ideology, medicine, war, and gender.

Different perspectives are given on the history of scientific discoveries. According to a sociological model of epistemology, which views science as a dynamic social system, the book makes the assumption that scientific knowledge is context dependent. The authors depict the historical, cultural and religious background of the time and place of the scientific developments.

Was the earth created in 4004 B.C. as the Genesis literalist Archibishop James Usshers published in the mid-seventeenth century, or is the age of the earth vastly longer, giving to evolution of species an adequate amount of time? And once Darwinism was accepted, what about the existence of the human soul? Religious and cultural values significantly influenced scientific thinking, and the history of science indicates that their influence is different in different countries and constantly changing over time. In the debate over conservation of energy, Sadi Carnot and William Thomson challenged Joule's theological conviction that nothing God created could be destroyed. Presently, creationists supporting the theory of intelligent design oppose Darwinism.

Most historians acknowledge that the parallel between Darwin's natural selection and competitive ideology of Victorian capitalism does not have to be rejected completely. Social theories, including Malthus's "struggle for existence" most likely provided inspiration to Darwin, although he applied this insight to the careful observations of the Galapagos ground finches to develop his evolution theory based on natural selection.

In the chapter of "plate tectonics" and continental drift theory, the dramatic revolution in earth sciences is described, originating from Wegener's seminal observation of the apparent "fit" between the coastlines of Africa and South America. This case is reported as an example of the sociology of science that makes clear the importance of research groups and new disciplines in establishing scientific theories, with the newer geophysics displacing the more traditional science of geology.

Even in the case of the fairly rapid acceptance of Einstein's theories of special and general relativity, the authors ascribe a decisive role to the changes in the field of physics itself, of mathematical physics dying out and theoretical physics coming into dominance.

According to Kuhn's Structure of Scientific Revolutions, discoveries are not well-defined and demarcated events, but processes that develop in a historical structure and in the particular context of a theoretical system.

Successive paradigms represent different perspectives, which are "incommensurable" with one another. Several episodic chapters in *Making Modern Science* are structured on Kuhn's reconstructions of scientific discoveries as in the fascinating discovery of oxygen by Lavoisier ("Phlogiston versus Oxygène"), and again in the simultaneous discovery of the "Conservation of Energy" about halfway through the nineteenth century by a number of scientists working independently.

Twentieth-century cosmology paralleled and completed the Copernican revolution: from Newton's infinite, absolute and unchanging uni-

verse to the currently accepted dynamic "island universe" model, with big-bang theories, black holes, and quasars. However this was a "revolution" based more on theoretical models hypothesized by cosmologists than on solid astronomical evidence.

During the 1960's, it was ironically argued that "there are only 2½ facts in cosmology": the observations that the night sky is dark, the observation of the recession of the galaxies, plus the half fact that the universe is evolving. Regarding the subjectivity of observational evidence in modern cosmology, Kuhn suggested that different observers with different opinions as to what is "really there" might in the same picture see either a duck or a rabbit.

Observations may indeed be structured by theoretical preconceptions. The period of Mendel's breeding experiments on garden peas for example, published in 1865, was a time when these experiments were performed by horticulturalists seeking better control over plant breeding.

Mendel, who died in obscurity, "was not himself a Mendelian", making no mention in his paper of tests on the law of heredity or paired material particles, but only of character differences in the peas produced. The rediscovery was made possible several decades later, after major developments regarding cell theory, reproductive process, and evolution theory. The traditional image of him as the precursor of genetics appears to historians to have been constructed to provide genetics with a creation myth.

The question of methodology is not central to the historical narrations. The authors nevertheless state that, according to many historians, "the more they studied the actual behaviour of scientists, the less it fits the idealised picture of the scientific method that the philosophers were devising". Furthermore, "there is no single scientific method because a nuclear physicist simply does not ask the same kind of question as an evolutionary biologist".

These positions are far from the unified methodology of science proposed by Carnap and Popper, whose influence was pervasive in western universities during the last century, after the emigration of several members of Wien's Circle from Nazi Germany.

Science is rather narrated as a human activity without a privileged status among other forms of knowledge – somehow echoing Feyerabend's thought.

This does not prohibit it from having, as the authors portray in various chapters, an overwhelming influence on society, with technological advancements serving the industrial-military complex, medicine, and business.

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Cellule e Cittadini
Biotecnologie nello spazio pubblico
Massimiano Bucchi e Federico Neresini. Milano: Sironi Editore; 2006. 238 p. ISBN 88-518-0065-0. € 14,90.

The volume *Cellule e cittadini*, which analyses public opinion trends, role of the media and their influence in decisional processes, is edited by Massimiano Bucchi, professor of Sociology of Science at the University of Trento and Federico Neresini, professor of Methodologies and Techniques of Social Research and Sociology of Science at the University of Padova.

The first part of the book focuses on Italians' orientations towards biotechnologies and on the results of a national survey. Survey that, far from standard stereotypes of scientific ignorance, shows how the Italian population tends to have different attitudes towards biotechnologies in medicine and biotechnologies in food and agriculture. More than 70% is in favour of medical biotechnologies, with the exception of therapeutical cloning, while 66% has many perplexities on the genetic modified organisms (GMO) exploited in agriculture.

The research highlights that a better scientific communication from the media does not guarantee a better awareness on the subject of biotechnologies.

The percentage of those who believe that only GMO tomatoes contain genes is almost identical both in the group of those who generally approach science through the media and in the group of those who do not. In addition, when five questions about biotechnologies are asked to the first group, a quarter would give only one right answer and 57% only two correct answers.

These data show that the influence of the media on the citizens' behaviour is not as relevant as generally thought and is a sort of reinforcement of pre-existing opinions. The weak link between knowledge and attitudes towards biotechnologies is confirmed by the fact that 49% of the most informed people believe that organisms genetically modified in agriculture are useful and that, nevertheless, 54% also think they are risky.

As a whole, those attitudes do not imply a lack of confidence in science, since 84% of Italians would consider extremely important the contribution that scientific research has given to the actual standards

of welfare and would attribute to scientists (working in both public or private institutions) the ability to generate positive social effects. Also positive is the confidence of the general population towards the institutes of research as source of information about biotechnologies. Regarding this last point, it is particularly meaningful that a fifth of the interviewed subjects consider as preferential source of information public events involving both scientists and citizens.

The other chapters of the book analyze in detail the complex social relationships exsisting between different actors of the debate on biotechnologies: scientific institutions, public authorities, media and citizens.

Brian Wynne, in the second chapter, highlights how scientific and governamental institutions played an important role in developing the general idea of a population dominated by a sort of irrational behaviour towards biotechnologies.

Valeria Arzeton, in the third chapter, emphasizes how the skepticism towards GMO is deeply influenced by the culture and the feeling that citizens have with regards to food.

In the fourth chapter, Andrea Lonzeret analyses articles related to GMO in two Italian newspapers (*La Repubblica* and *Corriere della Sera*), published from August 2002 to July 2003. This attempt to identify recurrent schemes in the GMO debate from the different actors involved, however, does not take into consideration the bias (in this subject) of the articles' authors.

Martin Bauer, fifth chapter, believes that the corrent UK situation is determined by the differentiation which occurred between agroalimentary and biomedical biotechnologies, also from a juridical point of view.

Biomedical biotechnologies are examined in the sixth chapter by Giuseppe Testa. A comparative analysis of the US, Italy and UK debates on cloning points out the differences in political decisions on the same scientific subject.

Mariachiara Tallachini, in the seventh chapter, traces the history of the juridical evolution as expression both of a technical-scientific uncertainty and of the mingling of science, society and institutions. This combination of elements is at the base of the ambiguity of the debate on biotechnology at European level, vacillating from the need to consider the citizens' opinion in making strategic choices and the market laws.

In the eight chapter, Giuseppe Pellegrini conciliates the citizens participation with the governance of highly complex problem, envisaging different participation ways in addition to those typical of a Representative Democracy.

An Appendix by Simone Sprea containing data on Italians' opinions on biotechnologies accompanies the volume.

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Animal Production Food Safety Challenges in Global Markets

World Organisation for Animal Health

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The World Organisation for Animal Health has identified food safety as one of the most important issues within the more general area of public health.

On that account it is more and more evident that food safety is of pivotal importance either in developed and in developing countries.

Volume 25(2) of the *Revue Scientifique et Technique* (OIE) entitled *Animal production food safety challenges in global markets* has been thought in order to offer the reader a wide description and at the same time detailed information regarding this particular aspect of public health.

The first chapters offer a detailed description of animal production systems in both industrialised and developing countries. Particular emphasis is posed upon the importance of animal trade and the effect of animal diseases on animal production.

The other chapters can be considered as updated reviews of the most important pathogens that influence the chain production of food of animal origin.

The discussed hazards covered either organisms (bacteria and protozoa) or chemicals such as residues of veterinary medical products, growth promoters and chemical pollutants.

Finally, the last chapters deal with the systems organised in different countries to face with challenges in food production and safety.

Overall, it seems that the general task of this issue of *Revue Scientifique et Technique* relies upon the intent to create the basis of a global, fair and homogeneous market in which every single participant is aware of the problems to address and of the expectations of the consumers.

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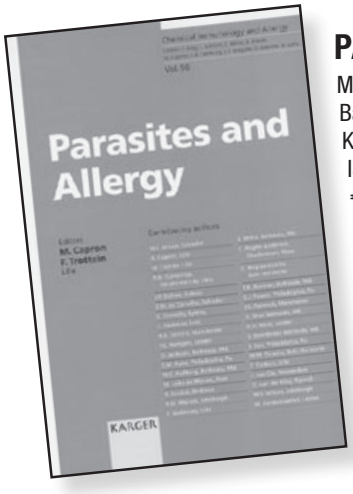

Parasites and Allergy

M. Capron and F. Trottein (Ed.).
Basel (Switzerland):
Karger; 2006. 202 p.
ISBN 3-8055-7974-8.
€ 127,00.

In this collection of 12 works, edited by Monique Capron and François Trottein, the results of the most recently conducted research reveal a new way of conceiving of the host-parasite interaction, in which regulatory-cell populations play a key role in the parasite-induced chronic inflammatory response. The wealth of experimental data also reveal not only the inhibitory capacity of helminths towards allergies but also how an allergic state or a predisposition to atopy can provide protection from helminth infection.

Most of the chapters in this collection emphasize the negative correlation between the prevalence of helminth infection and the severity and/or prevalence of allergies and autoimmune diseases. The increase in the prevalence of these conditions is found to be associated with a decrease in the immune regulatory capacity. For example, there continues to be increasing evidence in favour of the "hygiene" hypothesis, in which the decrease in incidence of infectious diseases in infancy is held responsible for damaging the capacity to develop the Th1 response, resulting in a tendency to develop allergies. In fact, a strong Th1 response can counterbalance the Th2 response typical to allergies. Epidemiological studies show an inverse correlation between the serum level of antibodies to the hepatitis A virus or *Toxoplasma gondii* antibodies and atopy.

Of particular interest are the experimental data showing that *Heligmosomoides polygyrus* (an intestinal helminth which parasites the small intestine of rodents) can act as a mucosal adjuvant, in that it induces a Th2 response, even when there is tolerance for a certain antigen. *H. polygyrus* acts as an adjuvant because it can contribute to cell differentiation, inducing the expression of co-stimulating molecules which are fundamental for activating the T-cells, particularly in the MLN that drain the GALT. Moreover, *H. polygyrus* induces eosinophilia in peripheral blood and high levels of IgE and polyclonal IgG1 in serum. It can also reduce the severity of the allergy in the host by inducing immuno-regulatory cell populations and through mechanisms involving IL-10.

Using different experimental models (e.g., the nematode *Strongyloides venezuelensis* or the trematode *Schistosama mansoni*) and assessing the reactions caused by allergies to foods or airborne allergens, it is shown how important helminth-induced IL-10 is in reducing the clinical manifestations typical of allergies, such as hyperbronchial reactivity. Moreover, a discussion of the probable IL-10-dependent mechanisms is presented, although the specific nature and intensity of action of these mechanisms remain unresolved.

An important chapter is that which focuses on the role of proteases in the helminth-induced inflammatory response. Using the nematode *Anisakis simplex* as a model, it is shown how helminth proteases contribute to the development of a Th2 immune environment. By causing tissue degradation in the host, the proteases of parasitic origin not only provide molecules with an intrinsic allergenicity but they also favour other allergens' access to the immune system's cells (dendritic cells, mast cells, basophils, macrophages, and B and T cells), modifying their properties by rupturing the surface receptors and consequently altering the signaling pathway.

Other works demonstrate the similarities between the mechanisms involved in parasite- and allergen-induced Th2 differentiation, although certain aspects remain unclear, such as the parasite-specific molecules involved in DC activation and the mechanisms that, regulating the interface between APC and CD4+, lead to Th2 differentiation.

There is also a detailed and in-depth analysis of the presence of glycans in helminths, which in some cases share epitopes with the host antigens, and at the same time, are potent inductors of the Th2 response. Another in-depth analysis is that regarding the interaction of glycans with dendritic cells and macrophages, which can create a balance between tolerance and immunity. Moreover, this review focuses on the mechanisms involved in the activation of NK cells during the initial phases of those events that lead to Th2 differentiation, on the role of lipids in promoting and regulating the adaptive immune response, and on the function of mucosal mast cells in the immune response to intestinal helminth infection. The interpretation of the biology and physiology of basophils and of their possible role in the immune response to helminth infection is also quite interesting.

This is a well-documented collection which undoubtedly constitutes an important contribution to the understanding of the mechanisms of immune regulation and which indicates some potential new directions in the prevention of inflammatory responses in auto-immune diseases and allergies and with regard to immunization against helminths.

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