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Book Reviews

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Book Reviews

Ian Hacking, *Historical Ontology*. Cambridge, MA; London: Harvard University Press, 2002. viii + 279 pp. $41.00. (cloth).

Ian Hacking's work in the history and philosophy of science is well known and requires little introduction. The reviewing author must admit that there are currently few philosophers of science whose work he admires as much as that of Hacking, Professor of Philosophy and affiliate member of the Institute for the History and Philosophy of Science and Technology at the University of Toronto. His accounts of scientific rationality, experimental investigation, and probability must be seen as profitable contributions to modern approaches in the historiography of medicine and the natural sciences.

My reading of Hacking's new book, however, began with a puzzle (the practice of reviewing books on philosophy of science thus remains an activity of problem solving, even if the philosophy of science no longer is, as the author appears to argue [pp. 38, 52f.]): what on Earth can yellow musk melons have in common with *historical ontology*, a connection suggested by the picture on the front cover? The illustration depicts seven melons with white clouds flowing freely over them in front of the open sea. Are the melons to be regarded as symbols of the nominalist position, the impartiality of metaphysical concepts, or even the fruitfulness of historiography for the philosophy of science? Or was the aim to evoke the usual prejudices which disparage the philosophical branch of ontology as mere daydreaming?

Whoever anticipated that *Historical Ontology* would be Hacking's principal and most comprehensive statement on the history and philosophy of science will be initially disappointed: the diverse and wide-ranging essays that constitute this collection – with the exception of the introductory chapter – were already published in scientific journals and anthologies between 1973 and 1999. During this period, Hacking wrote many influential volumes in various domains of philosophy and science studies, including *An Introduction to Probability and Inductive Logic* (2001), *The Social Construction of What?* (1999), *Representing and Intervening* (1983), and *The Emergence of Probability* (1975). A closer reading, however, reveals that the essays reprinted in his new book are a cohesive selection that convey well his distinctive philosophical grasp of intellectual history.

Historical Ontology is certainly a systematic formulation of Hacking's ideas. Despite the broad scope of the book, its topics are arranged according to three main concepts borrowed from Foucault's essay *What is enlightenment?* (1984). He calls these the cardinal *"axes of knowledge, power, and ethics"* required for the study of *"the historical ontology of ourselves"* (p. 2), an anthropological notion that Foucault does not appear to have much emphasized. Readers unfamiliar with Hacking's reflections on the French intellectual may ask whether these allusions to Foucault's archaeology of knowledge are merely rhetorical or should be understood as a programmatic statement. The same readers will, however, learn of the Canadian philosopher's profound debt to the French academic. As early as in *The Emergence of Probability*, Hacking has made use of certain of Foucault's observations

regarding the *"making up* [of] *people"* (p. 99f). in connection with problems such as multiple personality disorder and mental illness, as well as regarding the emergence of statistical approaches to social deviancy (pp. 112 and 142).

The introductory chapter outlines the concept of *"historical ontology"* and endorses Foucault's ventures into an *"archaeology of knowledge"* (p. 5) and a *"history of the present"* (p. 25). The author explores two closely connected issues: innovative means by which a philosopher of science might employ history, and an insightful introduction to Foucault's historicized conceptual analysis. Hacking then presents his own account of Foucault's *"archaeological method"*, having been considerably influenced by him for many years (p. 70). A major theme of this chapter is that many philosophical problems are essentially the result of historical developments. The emergence of concepts and objects, as well as the historical dimension of people is also placed by Hacking upon the agenda of analytical philosophy.

The importance of Foucault's reasoning emerges in the following four chapters. As might be expected, Hacking's book yields a great many insights into the original thinking of the French intellectual by clarifying for the novice a range of his concepts, such as those regarding the significance of classification, and the relationship between scientific practice and knowledge. Historical ontology is subsequently employed to unveil the specific historical conditions of scientific concepts, specific modes of research heuristics, and the discovery of epistemic things. Hacking's basic concern is the question of how objectivity comes into being and how certain standards of objectivity are maintained (p. 188f). This intersection of history and philosophy of science explains thematic coincidences in current research projects of historians of science who belong to the *"history plus roster"* (p. 7), referring explicitly to the investigations by Lorraine Daston and her colleagues at the Berlin Max Planck Institute (MPI) for the History of Science. Hacking then sets himself apart from this strand of *"historical epistemology,"* admitting that this results only in *"differences in emphasis"* (p. 10), as historians of science *"do not do epistemology,"* but, rather, historical *"meta-epistemology"* (p. 9).

This demarcation can be reformulated as a division of intellectual labor: while philosophers do not regard epistemology as a theory of knowledge, but rather as an investigation of the foundations of knowledge, historians are not looking for foundations (p. 9). This argument is spoilt somewhat by Hacking's own discussion of the French school of *"historical epistemology"* (pp. 9f. and 76f.), including Georges Canguilhem and Gaston Bachelard. These historians of science are frequently understood as historical epistemologists, a specific French tradition starting with Bachelard's *La formation de l'esprit scientifique* (1938). Bachelard and his academic pupils certainly held philosophical positions and are still read in French philosophy courses today. Although Hacking's argument – that an *a priori* distinction between epistemology and historiography exists in object and method – does not appear very convincing outside the American tradition, I do not believe that much hinges upon it. Further, I strongly support Hacking's stance that students of history and philosophy of science "must put aside the romantic cravings that so often occlude the vision of philosophers… Some mingling of history and philosophy can, however, exhibit how possibilities came into being, creating, as they did so, new conundrums, confusions, paradoxes, and opportunities for good and evil" (p. 7).

Historical ontology is subsequently defined by Hacking as an investigation of "what there is" and how "the comings, in comings into being, are historical" (p. 4f.). He focuses on specific examples of organizing concepts in the natural sciences and the humanities, whereby he discerns a divide between the natural and the human sciences with respect to the distinction of words from things, a divide *"constantly blurred"* (p. 50) in the humanities.

His own examples of natural objects (pp. 96–98) nevertheless exhibit dynamic patterns that give rise to frequent scientific debates. This holds especially true in the biomedical sciences, as he himself demonstrates with case reports of Post-Traumatic Stress Disorder (PTSD, p. 18), and child abuse (pp. 4 and 69f.). These examples rather lend support to Hacking's thesis that scientific *"concepts have memories"* (p. 37) with enduring connotations and constant social effects. Similarly, his contention that *"the experimental methods of the human sciences are something else"* (p. 50) is not entirely convincing; a variety of structural similarities between the experimental methods in the natural sciences and the arts has recently been discussed by members of the Berlin MPI in *Physiologische und psychologische Praktiken im 19. Jahrhundert* (1999). Historical ontology could more appropriately be seen as mediating issues of conceptual and objective changes in the natural sciences and the humanities when scrutinizing the fundamental "ways in which the possibilities for choice, and for being, arise in history" (p. 23). As such, Hacking sees himself as part of Foucault's tradition of *"dynamic nominalism"* (pp. 2 and 49f.), a standpoint which focuses on specific styles of reasoning by the introduction of historical concepts, based on what Hacking occasionally terms "depth knowledge" (p. 77).

Distancing himself from the skepticist and nominalist positions of social constructivist writers' views, Hacking investigates in Chapter Three how scientists come to believe their observations. Methodological problems of the natural sciences were basically constituted in their specific histories, especially with regard to claims concerning the reality of objects of scientific inquiry. Hacking maintains that many philosophical problems were associated with concepts such as "normality," "chance," "madness," or "criminality" (p. 71). Foucault had commenced this kind of study by pointing towards the development of similar concepts with their social and political implications. The investigation of *"possibilities for ideas"* was not limited, however, to concepts of disease or imprisonment, but would stretch to traditional notions of knowledge, power, and ethics (pp. 76–79). Referring to Canguilhem, Hacking situates Foucault in a quasi-Kantian position of a "historical a priori": while Kant posited a fixed body of synthetic *a priori* knowledge, Foucault insisted on the specific *savoir*of the time, place, and scientific community in which it emerged (p. 91). Hacking's interpretation is subsequently couched in anthropological notions of life, labor, and language. Foucault depicted these concepts as the material basis of the new disciplines of biology, economics, and linguistics in the nineteenth century, so that they would not correspond to their predecessors of natural history, the theory of wealth, and general grammar (p. 78). Accordingly, Chapters Eight and Nine take up this epistemological break, examining the inauguration of the public nature of language. Hacking perceives that an adequate account of the meaning of concepts must depend upon the very nature of the languages in which they are formulated (p. 138) and, referring to Johann Gottfried von Herder (1744–1803), notes that a language even molds its speakers (p. 128).

Chapters Ten to Twelve turn to more specific historical problems of concept identification and tagging. Hacking comments on ostentatious definitions in natural history and clarifies the logical possibilities of translation. While he employs the notion of a *"style"*– like Thomas S. Kuhn's *"paradigms"* – to indicate special driving forces in the history of science, he nevertheless wants to also include the practical side of experimentation (p. 183f.). This is essential for Hacking's historical exploration of *"the way in which objectivity comes into being"* (p. 188), an approach that he later dubs *philosophical technology* – that is, the philosophical study of scientific techniques that result in stable knowledge and standards of objectivity (p. 197f.).

The final essays in this volume lead us to Réné Descartes, Gottfried Wilhelm von Leibniz, David Hume, John Locke, and Ludwig Wittgenstein, centering on concepts of evidence, knowledge, and logic in specific changes of traditional ontology. Hacking singles

out different roles for language embedded in various social activities. In the final chapter, "Dreams in Place," the notion of significant dreams is analyzed in their historical context, and he supposes, with Descartes, that "rationality" could also have developed by contingent instances of anti-reason (p. 254). At this point, I could finally resolve the puzzle of the musk melons: they appear to refer to one of three dreams that Descartes wrote down at the moment of his epiphany (p. 228f). In the so-called *Olympica*, Descartes was given a melon from a far country, signifying the solitary life (p. 245f). Although I will not divulge Hacking's witty interpretation of Descartes' bad dream, a slightly altered version of the contemporary song he mentions might be: *"Have this in common with the melon:/You [may] try [any Chapter]/[And] you get a good one"* (p. 246).

The central part of the argumentation in *Historical Ontology* is not new, as most of the essays have already been published. Further, Hacking's account appears widely compatible with Kuhn's view on research paradigms in *The Structure of Scientific Revolutions* (1962): "History, if viewed as a repository for more than anecdote or chronology, could produce a decisive transformation in the image of science by which we are now possessed" (p. 1). Hacking nevertheless makes many interesting observations on general topics in the history of science with far-reaching consequences. In sum, the book is of interest to anyone engaged in philosophy, its history, and its broader intellectual environment. The individual essays contained in this volume lend additional insight into major topics of twentieth-century philosophy and epistemology. As a general remark on its philosophical orientation, Hacking's *Historical Ontology* could be placed between Richard Rorty's *Philosophy and the Mirror of Nature* (1979), with its revival of historicism in philosophy, and John McDowell's *Mind and World* (1994), with regard to its focus upon direct experience and a rational openness to independent reality.

Apart from more general issues of the relationship between philosophy and the modern historiography of science, Hacking offers interesting suggestions on different "*styles of reasoning*." How should we conceive the relationship between "the methodology of science"– in the singular – and the history and philosophy of the sciences – in the plural (cf. p. 196f.)? This also seems to be an enduring question with regard to holistic, modal, and atomistic approaches in (the) neuroscience(s) that cannot be reduced to semantic issues. With Ian Hacking, this debate may be rewritten as the story of (many) authentic research styles.

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J.A.M. Fredericks, G.W. Bruyn and P. Eling, eds, *History of Neurology in the Netherlands,* Amsterdam, Boom, 2002. 408 pp. Ill. 42€ .

The Netherlands, the name which the Dutch prefer to Holland as the designation for their country, was formed by the Republic of the Seven United Provinces (one of which is Holland proper) in the sixteenth century following their declaration of independence from the Spanish empire. It became one of the most important European powers, and a Golden Age of art, but also of medicine, ensued; Vesalius published his *De Corporis Humanis* in 1543, upon which the Dutch built their own medical tradition. The first teaching hospital in northern Europe opened in Amsterdam in 1636 on the site now named for Herman Boerhaave, whose clinical teaching, which included neurology, became internationally famous and is still highly regarded today.

Until now, there has only been one book published on Dutch neurohistory. Published on the occasion of the eleventh World Congress of Neurology in Amsterdam in 1977, it was written by Schulte and Endtz and titled *A Short History of Neurology in the Netherlands*. This new volume is much more detailed and consists of two main parts, each with fifteen chapters. The first part recounts the development of neurology in the Netherlands, with separate chapters on academic chairs, extra-academic centers, the Netherlands Society of Neurology, tuition and training, and neurological publications. In Chapter 1, there are interesting comments on discrimination against neurological trainees who had not mastered Latin and classical Greek, as well as against married trainees; the latter persisted into the 1950s, as marriage prevented devotion to twenty-four-hours duty.

The succeeding nine chapters concentrate specifically on individual clinical neurosciences: neurosurgery, neuroanatomy, neuropathology, neuroradiology, clinical neurophysiology, child neurology, epileptology, neuromuscular diseases, and neuropsychology.

The fifteen chapters of the book's second part each deal with significant contributions in various fields. The editors acknowledge that the selection process was difficult, but among the best-known international names included are Ariëns Kappers, Arie Biemond, Bernandus Brouwer, Dusser de Barenne, Frits Grewel, Hans Kuypers, Rudolf Magnus, and Johannes Rademaker. These chapters were written by holding annual meetings of the history section of the Netherlands Society of Neurology, each concentrating on a Dutch neuroscientist from the period 1890–2000.

It was only in 1909 that, with the formation of the Society of Amsterdam Neurologists, neurology was separated from psychiatry as a distinct medical specialty in the Netherlands. After the First World War, this demarcation was deepened by the institution of chairs for neurology in Amsterdam and Utrecht; academic departments now exist in Rotterdam, Leiden, Maastricht, Nijmegen, and Groningen. During the interwar period, the seminal work of Magnus and Adriaan de Kleyn on the neck and labyrinthine reflexes was

conducted; Aemilius Droogleever-Fortuyn discovered the three per second spike and wave cycle; Brouwer reported paraneoplastic cerebellar cortical atrophy; and Rademaker investigated the functions of the red nucleus.

Other well-known names include Gerbrandus Jelgersma on neuroanatomy, Ernst de Vries on neuroglia, Cornelis Winkler on cerebral localization, Brouwer on retinotopic function and Biemond on his famous textbook of neurology published in English in 1970. A hospital for epileptic patients was opened in Amsterdam in 1903 by Louis Muskens, co-founder of the International League Against Epilepsy and its Secretary-General until he died in 1937.

Initial descriptions of neurological disorders were also made outside academic circles. For example, Gerard Bolten discussed the albumino-cytological dissociation in cerebrospinal fluid six years before Guillain-Barré's paper. He is also famous for the psychiatric report on van der Lubbe, who was alleged to have set fire to the Reichstag in Berlin in 1933, thus giving the Nazis the pretext for ending German democracy. Following their invasion of the Netherlands, the Germans attempted to arrest him in early 1941, but he had died a few months earlier (in November 1940; one of the few mistakes in the book is that the date of his death noted under his portrait is given as 1941).

Another neuroscientist who suffered during the German occupation was Jan Willem ter Braak, whose brother committed suicide in 1940. Ter Braak refused to cooperate with the Germans in the transportation of Jews from the hospital, and he was imprisoned for six months. Another Dutch neuroscientist, Herman de Jong, was his "hospital's" contact person for the Physician's [sic] Resistance, and hid Jews during the War. He went into hiding in 1943, during which time he read Bumke and Foerster's seventeen volume *Handbuch* from "beginning to end." In 1955, he published a monograph on the myotonias.

This book is a mine of information, and to do its contents justice would require another book. Suffice to say this is a model monograph that is unlikely to be superseded in the foreseeable future. It can only be hoped that neurologists of other countries will emulate this example in providing such a valuable work of reference. I somehow doubt it, perhaps because the neurohistory of the Netherlands is something special. The Netherlands, with a population of 16 million, has 600 neurologists, twice as many as in the UK, which has a population nearly four times greater. This only partially explains why such important research by Dutch neurologists continues to this day.

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Harold Ellis, *A History of Surgery,* London: Greenwich Medical Media Ltd., 2001. xxiv + 264pp. £24.50.

This is a very readable, well illustrated, and brief history of the entire field of surgery from prehistoric times to a glimpse into a future with robotic surgery. Harold Ellis has distilled a vast amount of information to provide the reader with a well organized glimpse into surgical history. The first eight chapters present a chronological account of surgical high points up to the end of the nineteenth century. The remaining eight chapters deal with selected topics and specialties.

A question arises, however, regarding the intended audience of this book. Those surgeons who have an interest in the history of their specialty are already familiar with the general trends in the historical development of the field. For such readers, the book is too brief and lacks detail in many areas. There are several expanded vignettes that are of interest to the surgical specialist and generalist. Ephraim McDowell's daring foray into abdominal surgery is well covered. Ellis describes Astley Cooper as his surgical hero and accordingly gives a good account of his contributions. The introduction of anesthesia is presented with appropriate comments on the primacy of Crawford Long but his lack of acumen for not publishing his observations. Ellis provides longer discussions of antiseptic surgery, breast surgery, cutting for the stone, and thyroid and parathyroid surgery, as well as thoracic and vascular surgery. Although orthopedic surgery is given a separate chapter, other surgical specialties, such as neurosurgery, otolaryngology, and ophthalmology, are only touched upon briefly. These surgical specialists will therefore not find many answers to questions here.

If the medical and surgical student is to use this book, it should stimulate further reading. Unfortunately, there are no bibliographic notations to document sources for the statements and events or to aid further study. A detailed list of the 267 illustrations is provided, but not with the information required for additional research. There is a brief list of books for further reading, but none of these is a primary source.

The final chapter is entitled "Envoi – Today and Tomorrow". Ellis suggests a role for robotic surgery without entering into any discussion concerning the fact that the rate-limiting step for future surgery is conceptual, not technical. There are few instances in which surgery is limited by a lack of dexterity on the part of the surgeon that can be bettered by a robot. He admits to the lack of a future for cancer surgery, but sees a continued need for trauma surgery. While this is where much surgical intervention began, it is a far cry from the heights that surgery has achieved over the past millennium. The book is a place to start and is sufficiently well written that a reader will gain an organized overview and be stimulated to proceed further into surgical history.

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Daniel P. Todes, *Pavlov's Physiology Factory: Experiment, Interpretation, Laboratory Enterprise*. Baltimore MD: John Hopkins, 2002. 512 pp. Ill. $59.00 (hardcover).

The past decade witnessed the publication of two major studies of experimental biology: Robert Kohler's *Lords of the Fly* (1994), which treated the birth of genetics, and Gerald Geison's *The Private Science of Louis Pasteur* (1995), which was concerned with the birth of immunology. Both monographs made powerful claims. Kohler's analysis extended Darwin's metaphors of industry and competition from the field to the laboratory, interpreting the fruit fly as an "instrument" manufactured to fit the needs of research scientists. Kohler considered that the development of genetics could be understood as an instance of modernization, one in which personal judgment and regional style ultimately succumbed to the pressures of scientific productivity. Geison extended a similarly progressive

argument. Laying his emphasis upon secularization, he employed discrepancies between manuscript and printed records to expose the patron saint of medical science, Louis Pasteur, as a liar, a cheat, and a thief. Interestingly, Pasteur's scientific achievements suffered little in his critical assessment.

Now a third distinguished historian of biology, Daniel Todes, has joined this mid-Atlantic triumvirate (Todes teaches at Johns Hopkins; Kohler teaches at Penn; the late Geison taught at Princeton). Like his colleagues, Todes compiles his history from a huge volume of primary material, including laboratory notebooks, personal correspondence, ministerial records, student dissertations, institute reports, scientific papers, physiological textbooks, university lectures, occasional addresses, and disciplinary memoirs. Indeed, a better picture of Pavlov's early researches into digestion can hardly be imagined. The entire narrative covers only thirteen years (1891–1904) in the Russian scientist's long career.

This deliberate pace offers Todes the advantage of focus. Borrowing from the image in his title, Todes considers in turn the design, function, and products of Pavlov's physiological "factory," an arrangement that permits readers to track a path from the pockets of his patrons through the protocols of his practice to the provincial patients he cured of dyspepsia. The most interesting section in this assembly reviews the operation by which dogs were surgically transformed into miniature pumps of gastric juice, a procedure necessary for the standardization of digestion experiments. Here Todes underscores the difference between production and automation. All factories require the constant application of craft, something no less true in the making of science than in the making of widgets. Todes suggests that Pavlov's attention to regulation – whether in the form of institute reports, curves of physiological response, or behavior of assistants and animals – reflected the challenge of environmental chaos. Todes thereby implies a parallel between the authoritarian style of Pavlov's physiology and the authoritarian style of Russian politics, both arising from putative conditions of ungovernability.

The idea is provocative, and it illustrates the subtle cast of Todes' thinking. Not since Russell McCormmach's *Night Thoughts of a Classical Physicist* have I read such a careful meditation on the historiography of science. In fact, Todes' whole account of the production of scientific knowledge can be read as a discussion of the production of historical knowledge. Like science, history simplifies a mess of contradictory evidence; like science, history rewards organization as much as insight; like science, history builds upon the past. One distinction, however, remains. Art is necessarily self-aware, as is Daniel Todes. He accordingly leaves me wondering to what extent good scientists – like good historians – realize more than they reveal. Probably a great deal, which renders *Pavlov's Physiological Factory* all the more sensitive and sophisticated.

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Otto Magnus, *Rudolf Magnus: Physiologist and Pharmacologist (1873–1927)*. Dordrecht: Kluwer. 2002. xi + 350 pp. Ill. 70.00 € /$77.00/£48.00 (hardbound).

Little published information concerning the life and work of Rudolf Magnus has been available until now, and it is surprising to note that a candidate for the Nobel Prize, recognized in both Europe and America, has attracted so little attention from medical historians. His son, Otto Magnus, born in 1913, recently produced an account of the life of his father. One might expect that a biography written by a family member would probably fail to present an objective picture; even worse, it might be more a hagiography loaded with "inside" stories. Otto Magnus, himself a respected neurophysiologist, had access to various diaries of Rudolf and his parents, and was thus acquainted with many details of Rudolf's personal life, and the reader is indeed presented with a detailed description of Rudolf's education and his road to his professorial chair. But Otto restricts himself to presenting facts rather than broadcasting gossip. In fact, I sometimes missed a word of interpretation, realizing that Otto, being a family member and familiar with the scientific issues that his father addressed in many articles, chapters, and books, probably could have added some relevant context.

The book gives an overview of Rudolf's life in a chronological manner, with chapters dedicated to the family background, Rudolf's childhood and student years, and his career in Heidelberg. He collaborated during this period on temporary projects with Schäfer in Edinburgh, von Uexküll at the Zoological Station in Naples, Langley in Cambridge and Sherrington in Liverpool. Rather than discussing the nature and the meaning of these studies, Otto provides us with short, systematic summaries of some of the articles (introduction, problem, experiments, summary of results, and conclusions, mostly in paragraphs of two or three sentences). As a kind of intermezzo, we read about Rudolf's analysis of Goethe's scientific studies; he replicated his experiments in their original formats and noted some errors of interpretation, work resulting in a book titled *Goethe as a scientist*. The story continues in the Netherlands, with Rudolf accepting the first Dutch chair of pharmacology in Utrecht in 1908. The next chapter deals with Rudolf's *opus magnum*, the Croonian lecture on "Animal Posture," which was also published as a book in 1924 and which is still cited today. The fact that Rudolf was also respected in the United States is illustrated, among other things, by the invitation to present the "Lane lectures" in San Francisco in 1927. Otto gives a sober overview of the correspondence concerning the organization of this trip and related invitations for lectures in other places. Unfortunately, while preparing this series of lectures, Rudolf died suddenly in Pontresina, Switzerland. In an epilogue, Otto describes the sudden death and he also depicts Rudolf's relationships with some of his closest coworkers, Adriaan de Kleijn, Willem Storm van Leeuwen, Joan Willem le Heux, Gijsbert Rademaker, and Joannes Dusser de Barenne. A short description of the history of the Magnus Institute can also be found in the book. Probably the best known neuroscientific institute in the Netherlands, it was named for Magnus by David de Wied in 1968, but Rudolf had himself founded it in 1908. Finally, Otto includes a bibliography and a useful index of names.

We must be grateful to Otto Magnus for delivering us a very useful overview of the life and achievement of his father. Almost no information concerning him had previously been published and much research still remains to be undertaken, but we now have a first portrait, albeit more a black and white picture rather than a colorful impressionistic painting. Otto had access to very useful sources and restrained himself when describing the

relevant events. I am convinced that this book will be a rich source for anyone who wishes to learn more about this remarkable neuroscientist, a pioneer in the area of the neurophysiological mechanisms of posture and movement as well as in neuropharmacology.

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Chris Code, Claus-W. Wallesch, Yves Joanette, & Andre Roch Lecours, eds. *Classic Cases in Neuropsychology, Volume 2*. Hove and New York: Psychology Press, 2003. xviii + 362 pp. £39.95/$59.95.

One cannot emphasize enough that neuropsychology is a branch of the neurosciences that is stimulated time and again by the thorough analysis of individual patients with special patterns of impairment, such as Tan or H.M. Some neuropsychologists argue that single-case analyses in particular provide valid information and a useful insight into the functional architecture of the brain. There thus exists a journal entirely dedicated to individual case studies, and a number of books consisting of collections of single-case descriptions have also appeared during the past few years. One of these books is *Classic Cases in Neuropsychology*, edited in 1996 by the international team of Chris Code. The editors were aware that some interesting material had not been incorporated in their first work, and they now have edited *Volume 2* according to the same principles as the initial volume.

Each chapter is dedicated to a historically significant case or series of related cases. The nineteen chapters include classics such as Dejerine's case of alexia without agraphia ("Monsieur C."), Teuber, Milner, and Squire's "case NA" with severe amnesia following a diencephalic lesion, as well as patients with peculiar delusional misidentifications, in particular the Capgras and Fregoli delusions. However, we also find cases that have not played a prominent role in the literature, such as Frau Fretz, described by Wolff in 1903 and now considered to be the first description of deep dyslexia, a syndrome defined by Marshall and Newcombe in 1966. An exceptional case in this collection is indisputably that of the influential article which transformed aphasiology into neurolinguistics: the Caramazza and Zurif studies (1976). Perhaps these examples provide a rather mixed picture of what have been regarded as classic cases in this book, but the majority of chapters deal with indisputable classics.

Although the editors divided the chapters into two groups, the contributions cover a broad range with respect to both neuropsychological deficits discussed and publication date, and without any obvious structure. An attractive feature of all chapters is that they not only present details of the original study, but also discuss the relevance of each case description with respect to current theory. In doing so, the authors underline the value of tracing the historical roots of our field, an aspect that is even better developed than in the first volume. This may be due to the fact that many authors also contributed to the earlier volume and have learned from this experience.

It was great fun to read these small chapters. However, they can certainly also serve a very useful purpose in teaching neuropsychology. In the same way that many scientists have been interested in "the experiments of nature," students will themselves be motivated

to unravel these remarkable puzzles. Apart from the intrinsic relevance for neuropsychology, these chapters also provide a fine view of the practice of science, at least in the area of neuropsychology and (behavioral) neurology. They show us how stories of unexpected phenomena sometimes influenced thinking and theory, even if the original analysis appears to have been flawed. Broca's patient, for instance, did not have Broca's aphasia, and Goldstein and Gelb's Schneider adapted very well to their ideas about the influence of brain damage on perception and reasoning. Another example can be found in the humorous chapter of Marshall and Halligan on the notion of representational neglect as described by Bisiach and Luzzatti in 1978. Marshall and Halligan convincingly argue that the patient, when asked to describe the Piazza del Duomo, mentioned buildings that were undoubtedly invisible from his perspective. He was, therefore, not employing a representation in his mind as the source of his description, and the fact that he neglected to describe half of the Piazza does not indicate that only half of such a representation was accessible. As indicated in the chapter, Bisiach himself was very surprised by the large and continuing interest in his paper.

Particularly interesting for this history of science approach are the follow-up analyses of how a particular case or article has played a role in later or current discussions. In all, *Classic Cases in Neuropsychology. Volume 2* is another rich source of information for researchers and students, and at the same time a volume of entertaining literature.

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Christian Baumann, *Der Physiologe Ewald Hering (1834-1918). Curriculum Vitae*. Frankfurt am Main: Dr Hänsel-Hohenhausen, 2002. 171pp. 35€ .

In visual neuroscience, Ewald Hering has tended to stand in the shadow of Hermann Helmholtz. Hering's theories of binocular visual direction and color vision stood in stark contrast to those proposed by Helmholtz. Hering emphasized the subjective and physiological dimensions of visual experience, following in the tradition of Goethe and Purkyne, while Helmholtz embraced the empiricist tradition of British philosophers, and adopted interpretations based more on physics than on psychology. Much has been written about their controversies and their respective impact on contemporary neuroscience (see Cahan, 1993; Turner, 1994).

Baumann's book provides a welcome antidote to this contrasting approach: Hering is allowed to stand on his own feet, and grows taller as a consequence. As the title indicates, Hering is followed through his extensive and active scientific career, and his many contacts and collaborations are detailed. He studied medicine at Leipzig under (amongst others) Ernst Heinrich Weber, and remained there as a lecturer. He developed a deep interest in the physiology of vision and, between 1861 and 1864, published five extensive contributions on the subject. It was through these that the seeds of the controversy with Helmholtz were sown. In 1865, largely as a consequence of these publications, Hering received the call to succeed Ludwig at the Josephinum in Vienna. In addition to continuing

his research on eye movements and space perception, he collaborated with Breuer on establishing the reflex regulation of respiration, now called the Hering-Breuer reflex. Both Hering and Breuer were later to make great strides in the measurement and analysis of eye movements. For Breuer it was in the context of vertigo, where he employed afterimages to record nystagmus following body rotation. For Hering it was in the context of reading, where he devised a simple method for detecting bursts of muscular activity that accompany saccades.

These advances, however, were made after Hering had left Vienna for Prague in 1870. He was the successor to Purkyne as Professor of Physiology at the German-speaking Charles University. Hering's publications and collaborations were remarkably wide-ranging during his twenty-five years in Prague: he met and impressed the young Freud, collaborated with Head, and commenced his studies on color vision. These opened up another rift with Helmholtz, who had extended Young's three-color theory by proposing that there were three types of nerves with energies specific to the red, green, and blue segments of the spectrum, a theory based on evidence that all colors could be mixed from three primaries. Hering's starting point was in color experience rather than color mixing: he argued that there were three color pairs or opponents, corresponding to white-black, red-green, and yellow-blue. He also examined simultaneous and successive color contrast phenomena and color blindness. He speculated that there were three retinal pigments that were either built up or broken down by light to yield the six elements. Modern color theory has shown both Helmholtz and Hering to be correct in principle but wrong in detail: the initial stage involves three cone pigments (not three kinds of fibers), the signals from which combine neurally (not in the action of the pigments) to produce the opposing pairs.

Hering's period in Prague was not without its political problems. As rector, he presided over the division of the University into German and Czech speaking institutions. In 1895 he returned to Leipzig where he was, for a second time, the successor to Ludwig. There he was accorded many honors, but he did not cease his research. He continued to investigate color vision, stereoscopic vision, and strabismus, and he embarked on new investigations of visual acuity. His writings on vision continue to excite the interests of students and scholars; three of his books or handbook chapters were translated into English long after his death.

Baumann weaves these many threads of Hering's life into a pleasing pattern. We learn not only about Hering's achievements but also about those of his students, and the many social and intellectual interactions in his busy life. As Baumann relates: "Hering's lifetime corresponded approximately to the classical period of the German Universities." As such, the book provides us with an intriguing social as well as an intellectual history of one of the pillars of nineteenth-century neuroscience.

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