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OBSERVATION AND ITS HISTORY

Lorraine DASTON – Elizabeth LUNBECK, E. (eds.), *Histories of Scientific Observation*. Chicago – London: University of Chicago Press 2011, 460 pp.

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The seventeen essays edited by Lorraine Daston and Elizabeth Lunbeck are the first attempt to provide observation, a fundamental practice of modern science, with its proper history. The book is a result of the History of Scientific Observation project directed by one of the editors, Lorraine Daston, at Max Plank Institute for the History of Science in Berlin. As the editors suggest, the essays can be divided into two parts. The first three essays, covering more than a millennium, frame an outline of the history of the practice and the concept of scientific observation. They set the stage for case studies that make up the remainder of the texts. In the contributions of Katharine Park (*Observation in the Margins, 500-1500*), Gianna Pomata (*Observation Rising: Birth of an Epistemic Genre, 1500-1650*) and Lorraine Daston (*The Empire of Ob-*

servation, 1600-1800), the advent and affirmation of the epistemic genre of observation in science is reconstructed in three different phases. Gianna Pomata demonstrates that the story of scientific observation is a modern story. Apart from the so-called empiric physicians of Hellenistic age, ancient science did not use the epistemological category of observation. Hellenistic empirically minded physicians refused Aristotelian subordination of experience to memory and reason, and used a distinct word (*tērēsis*) to denote a philosophical category of observation in medical practise.¹ As Katharine Park notes, for Pliny, who was one of the main sources of medieval encyclopaedias, observation meant only the interpretation of natural signs. The empirical activities of ancient philosophers and natural historians were denoted by the Greek *empeiria* or the Latin *experientia* and *experimentum*.

The emphasis on observation of early modern science derives from the work of astronomers like Tycho, and from the recovery of ancient medicine in the Renaissance.² This

¹ Gianna POMATA, "A World of Empirics: The Ancient Concept of Observation and Its Recovery in Early Modern Medicine." *Annals of Science*, vol. 68, 2011, no. 1, pp. 5–7 (1–25).

² Gianna POMATA, "Sharing Cases: The Observations in Early Modern Medicine."

“new entry” of modern scientific lexicon from the sixteenth century does not mean any more medical prescriptions but the first-hand check of the diligent observatory of Nature (p. 47). In the seventeenth century, as Lorraine Daston shows, the emergence of experimental philosophy introduced the distinction between observation and experiment. From Francis Bacon to Claude Bernard, the observation of nature in her ordinary course is distinguished from the artificial intervention of experiment. What Bacon called artificial experiments became the model for experiment *tout court*. Since the seventeenth century, observation has been associated with open-minded study of the ordinary course of nature, while experiment became a synonym for active intervention of researchers by means of artificial devices and of the audacious questions they wanted to verify. As a result of this experimental innovation, in the eyes of historians of science observation has played a subordinate role in modern science.

The case studies of the second part of the book offer arguments to challenge this view. These essays highlight the main epistemological features of scientific observation, suggesting a different conception of

its status in modern science. In the second section, the contributions of Domenico Bertoloni Meli (*The Color of the Blood: Between Sensory Experience and Epistemic Significance*), Michael D. Gordin (*Seeing is Believing: Professor Vagner's Wonderful World*) and Charlotte Bigg (*A Visual History of Jean Perrin's Brownian Motion Curves*) discuss how scientists provided evidence by means of observation. The scientific community's acknowledgement of the existence of new phenomena is founded on the availability of first-hand observations and visual representation of them. Bertoloni Meli's essay highlight the observation of the changing colour of blood in air and its interpretation in the context of mechanical and chemical philosophies of the seventeenth century. In the course of some experiments carried out at Pisa between 1656 and 1659, the Galilean natural philosopher Giovanni Alfonso Borelli and the anatomists Marcello Malpighi and Carlo Fracassati noticed the changing colour of blood from dark to bright light once in direct contact with air. Even if Malpighi later observed the same phenomenon during a dissection of the lungs, Italian scientists did not acknowledge the physiological relevance of the fact. Only when the so-called Oxford physiologists learned about the observation, thanks to their chemical approach

to life the physiological role of air in respiration became apparent.³

On the contrary, as Michael Gordin shows in his contribution, the evidence of phenomena derived by direct observation was sometimes sufficient to award a theoretical meaning to facts, for instance, as was the case in the 1863 observation of sexually immature larvae reproduction by the Russian zoologist and writer Nikolai Vagner. However, evidence is not the only effect of first-hand observations. At the end of the second section, Charlotte Bigg's contribution shows that sometimes evidence can be achieved only by illustrations. From 1903, seeking to demonstrate the real existence of atoms and molecules, the French physical chemist Jean Perrin was able to represent what Albert Einstein thought was not representable, the Brownian motion of colloid particles. By means of statistical analysis of numerous measurements, Perrin compensated the approximation due to the lack of high precision instruments, and drew a simplified representation in two dimensions of the phenomenon. In November 1909, in admiration of Perrin, Einstein wrote: "I would have thought such a precise study

of Brownian motion impossible to realize" (p. 156).

Patience and skill are prerequisite for any successful observation. In order to make inaccessible or intractable phenomena observable, ingenious inquirers have to invent or adopt new techniques observation. In the third section of the book, Mary Terrall (*Frogs on the Mantelpiece: The Practise of Observation in Daily Life*), Harro Maas (*Sorting Things Out: The Economist as an Armchair Observer*), Jimena Canales (*A Number of Scenes in a Badly Cut Film: Observation in the Age of Strobe*) and Elizabeth Lunbeck (*Empathy as a Psychoanalytic Mode of Observation: Between Sentiment and Science*) describe the strategies used by some natural and social researchers to face observational problems. From the low-tech operations of the eighteenth-century French naturalist René-Antoine de Réaumur described by Terrall, to the high-tech stroboscopic instruments employed by twentieth-century physicists as described by Canales, researchers have always adopted adequate observational strategies to make visible their inaccessible object.

In the fourth section, Theodore Porter (*Reforming Vision: The Engineer Le Play Learns to Observe Society Sagely*), Mary Morgan (*Seeking Parts, Looking for Wholes*), Otniel Dror (*Seeing the Blush: Feeling Emo-*

³ Robert FRANK Jr, *Harvey and the Oxford Physiologists: A Study of Scientific Ideas*. Berkeley - Los Angeles: University of California Press 1980.

tions), and Kelley Wilder (*Visualizing Radiation: The Photographs of Henry Bequerel*) show how the strategies undertaken in some cases define what is observed. Theodore Porter demonstrates how the French engineer Frédéric Le Play became a social scientist in the second half of nineteenth century. The importance Le Play accorded to social surveys and the criticisms of statistics illustrate the role of social analysis in the formation and strengthening of his conservative views on social structure. Mary Morgan describes the strategies employed by European economists to adapt NIA (national income accounting) to non-European economies, while Otniel Dror reconstructs the shift from psychological to physiological approach to emotion in the late nineteenth and early twentieth century. At the end of the section, Kelley Wilder emphasizes the role of technical strategies adopted by the French physicist Henry Bequerel to visualize the radiation of matter. Wilder's essay shows how Bequerel bequeathed materiality upon the new discovered property of matter where it has had none before. This also enabled Bequerel to distinguish it from the X rays illustrated by the German physicists Wilhelm Röntgen.

Contributions by Daniela Bleichmar (*The Geography of Observation: Distance and Visibility*

in Eighteenth-Century Botanical Travel), Andrew Mandelsohn (*The World on a Page: Making a General Observation in the Eighteenth Century*) and Anne Secord (*Coming to Attention: A Commonwealth of Observers during the Napoleonic Wars*) make up the last section. Focusing on natural history in the eighteenth-century, the authors highlight the collective nature of scientific observation. Even if it is carried out by scientists dispersed in space and time, communal dimension is required to organize and coordinate individual activities on shared topics. Real or virtual communities always coordinate the efforts of different eyes and hands in observation. This is manifest in the case of Spanish botanists in South America as discussed by Bleichman and, similarly, in the descriptions of the French physicians and physicists described by Mandelsohn or the British marine botanists analysed by Secord.

One obvious way of reading the essays in this book would be to follow the editors' classification of them based on different analytical approaches and arguments (evidence, techniques, objects and communities). But this is certainly not the only way. The role of theory, technology, illustration and community are only some of the main epistemological questions of observation in science. In fact,

the sectional boundaries can be transgressed by underlining other epistemological problems. By following such an approach, regardless of the disciplinary differences or rather because of them, each case study becomes a stage illustrating pertinent features of scientific observation. Covering a long period spanning from the Middle Ages to the twentieth century and across a wide number of disciplines, *Histories of Scientific Observation* is an invaluable read for all historians, philosophers and sociologists of science interested in the nature of a fundamental practice of modern science.

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KDO JE HANS ALBERT?

Robert ZIMMER – Martin MORGENSTERN, *Gespräche mit Hans Albert*. Münster: LIT Verlag 2011, 168 s.

Jitka Paitlová

Vzhledem k tomu, že německý filozof, zástupce kritického racionalismu a Popperův následovník, Hans Albert (dále jen Albert) je v českých odborných diskusích dosud téměř neznámou osobou, kniha *Gespräche*

mit Hans Albert (Hovory s Hansem Albertem – dále jen Hovory) je nanejvýš vhodná pro seznámení se s jeho myšlenkami. Albertovy názory jsou totiž v *Hovorech* prezentovány velmi přístupnou formou, zároveň však erudovaně a v nezvyklé tematické šíři, což se tato delší recenze pokusí zprostředkovat pro potenciální čtenáře, kteří dosud s Albertovými pracemi nepřišli do styku.

Ač by se na první pohled mohlo zdát, že forma rozhovoru může být málo filosofická, příliš popularizační a sklouzávat k povrchnosti, v průběhu čtení se naopak ukazuje, že je to forma filosoficky zcela plausibilní. Albert není žádný debutant, nýbrž zkušený (v době vydání *Hovorů* devadesátiletý) filozof a emeritní profesor, jenž má již svoji filosofickou pozici kritického racionalismu vytříbeně promyšlenou a dokáže proto své názory formulovat naprosto jasně a zřetelně (většinou mu na zodpovězení otázky stačí několik stručných, zároveň však významem hlubokých vět). Přirozeně, že forma rozhovoru zčásti představuje popularizační krok, který má Albertovy myšlenky zpřístupnit těm, kteří se s ním setkávají poprvé (jako právě například většina české akademické veřejnosti). To však není nijak filosoficky diskreditující, ba naopak, je to filosofická forma par excellence – vždyť dialogickou formu užíval k výkladu již Platón. V tomto smyslu se vyjadřuje sám