Sadegh-Zadeh, K.: 2012, *Handbook of Analytic Philosophy of Medicine* (Philosophy and Medicine series, vol. 113). Berlin: Springer. 1133 pages. ISBN 978-94-007-2259-0. Price: € 222,45.

Why are there so many "misdiagnoses, wrong treatments, and physician-caused misfortunes, pains and deaths" (p. 2)? Why are, according to one study, 30-38 % of all diagnoses incorrect (p. 4)? These intriguing questions triggered the research of Kazem Sadegh-Zadeh and led him into analytic philosophy of medicine, applying logical and conceptual analysis to this field. The result of his research is now collected into this enormous book that can be a useful source of inspiration for analysts of medical knowledge. It is, however, somewhat misleadingly labelled as a "handbook". The reader should not expect to find a balanced multi-perspective treatment of the field by a group of experts (like, e.g., the Elsevier-handbook edited by Fred Gifford), nor an introduction (like *Medicine and Philosophy* by Ingvar Johansson and Niels Lynøe), but rather the personal views of the author on an ongoing discussion. The volume is the fruit of nearly 50 years of thinking about the subject (p. 8, p. 814), and could thus be appropriately called the *summa* of a researcher's life.

The book starts with an analysis of medical language (pp. 11-106), medical practise (pp. 109-380) and medical knowledge (pp. 383-551). Then, it continues with medical deontics (pp. 555-583), medical logic (pp. 587-681) and medical metaphysics (pp. 685-786). To help with logic, the book comes with a 200-page appendix "Logical Fundamentals" (pp. 821-1042!), rehearsing the standards of logic from set theory to fuzzy logic.

The author combines traditional topics like the verification problem and the structuralist account of theoretical entities with more recent topics like social epistemology and social ontology, and he even brings in the social constructivist theory from cultural studies. The author pictures medicine as a practical science on the verge to become an engineering science (p. 781). As a practical science, medicine consists of a bunch of practical rules, and not as much of assertions. According to the author, these rules are established as social institutions by way of social contract (p. 520). One of the problems of medicine is that central concepts like "health" and "disease" are undefined and vague, which leads Sadegh-Zadeh to borrow from prototype theory and fuzzy logic to suggest a formal framework for a definition of disease. Also, as a practical science medicine does not aim at truth. In fact, according to

Sadegh-Zadeh, there is not much truth in medicine, "because it mainly consists of hypotheses and deontic rules", and if there is truth, it is "system relative" (p. 762).

Impressive as it is, I have some reservations about the *Handbook*. First, I think the author is overstating the constructivist perspective. It is true that today's medicine comes along with licensing processes, approved guidelines and legal regulations. But medicine has once started without this institutionalized superstructure, and at its borders as well as at its foundations it still has to do without.

Second, Sadegh-Zadeh underestimates personal and non-propositional knowledge. His focus is exclusively on non-personal propositional knowledge. Nevertheless, he does not discuss the relevance of acquired personal abilities of medical practitioners and their implicit knowledge.

Third, there seems to be a tension between constructivist and verificationist strands within the book. As a social constructivist, Sadegh-Zadeh can admit that "no scientific knowledge is true" (p. 346). But this is not compatible with his argument that many sentences "can never constitute knowledge because, due to their [syntactic] structure alone, they are not verifiable and thus cannot turn out, or be considered, true" (p. 396). Moreover, these "truth-repellent syntaxes" (p. 758) are not well argued for. For the author, no unbounded universal statement is true (p. 486) – as this is itself an unbounded universal statement, it cannot be true. His claim is motivated by the assumption that universal conditional sentences are not verifiable in infinite domains, whereas existential statements are not falsifiable therein. This is, however, false: "All mammals are vertebrates" and "All multiples of 4 are even numbers" are both true, and the latter is even probable in the infinite domain of natural numbers, as well as "There is a highest prime number" can be shown to be false. Hence verifiability does not hinge on syntax but on semantic content; and even if a sentence turns out as non-verifiable, this would not imply that it cannot be true. Given Sadegh-Zadeh's institutional approach to medicine, it might have been better to refrain from using the language of "knowledge" and "truth" altogether and use the language of "acceptance" and "usefulness" instead.

These quibblings (and some others) aside, the book can be recommended to anybody who thinks about the rationality of medical treatments, philosophers and practitioners alike. The volume presents a cornucopia of useful material that could trigger further thinking on the topic. To its full extend, however, it will only be accessible to those that are willing (and able) to read logical notation.

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