HAROLD J. COOK, *Matters of Exchange. Commerce, Medicine and Science in the Dutch Golden Age*. Yale University Press, New Haven and London, 2007.

The very last sentence of this work says that "The beginnings of a global science occurred during the period of the rise of a global economy. Surely that was no coincidence" (p. 416). In fact, while concentrating on the Netherlands and its overseas empire - an area still comparatively neglected by mainstream narratives of science, despite its centrality and at times cruciality to the history of European knowledge – the scope of Cook's volume is not limited to the Dutch world. In the last few years historians of science and medicine have given considerable attention to the meaning of objects and tot heir exchange. Cook goes one step further, and extends the model of 'objectivity', as understood in the world of commerce and exchanges, to represent and to explain, in a certain sense, the whole of the age that has been called of the Scientific Revolution. He draws on a conspicuous body of literature, at times better known to historians of economic and political history than to historians of science, dealing with the role of 'passions and interests' in shaping the early modern cultural landscape, arguing that in doing so they shaped and indeed created 'science' as well. There is a chronological pattern emerging from the ten chapters of the book, starting with the 16th century and moving on to the early 18th. The single chapters may also be seen as structured around the lives and work of members of the personnel of the Dutch East India Company (VOC), established in 1602, as well as of a number of natural philosophers, academics, and doctors living in the Netherlands. Some of them are very well known - as in the case of René Descartes or Hermann Boerhaave. Others are comparatively unknown. On the whole, their biographies, often adventurous, provide a fascinating background and put flesh on the bones of Cook's thesis.

The first three chapters are more general in scope, dealing respectively with the development at a European level of a new culture of taste and bodily experience, and of a global 'information economy' in which objects were considered essential to the betterment and refinement of individuals, households and larger communities. Cook argues that "the material details of the world as perceived by the senses became the foundation for a new approach to knowledge" (p. 41), and that the careful description of these details provided a framework for 'scientific' empiricism. The exchange of objects - works of art, natural specimens, but also words and notions, as well as representations and illustrations - was regulated by the same laws as the financial transactions, as evident for instance in the case of the tulip mania of the early 17th century, when bulbs were collected and sold at auctions at incredible prices. This was not the only area in which ethical and behavioural patterns coming from the economy of 'interests' exercised their influence, though: Cook also stresses the crucial importance of reputations and the value of information in the scientific world. The third chapter deals with the wide-ranging question of the relations between religion and knowledge. Cook examines the classic theses put forward by Weber and Merton, rejecting the simplistic connection between Protestantism, asceticism and the rise of capitalism - and of modern science. He points instead at Charles Webster's illustration of the utilitarian stance in Puritan eschatology as providing a model for a more nuanced approach. The hero of the chapter is the learned botanist Carolus Clusius, whose lifetime spanned from the revolt against Spanish rule and the foundation of Leiden university (in 1575) as a stronghold against catholicism, to his appointment as the head to the newly-founded botanical garden, where he contributed to the introduction of the first specimens sent from the Indies.

The first decades of the 17th century are dealt with in the three chapters that follow. The life of Dr. Claes Tulp, whose claim to notoriety

is by no means limited to his being the central character in one of the best-known pictures by Rembrandt, well illustrates the situation of medical practice in Amsterdam. Apothecaries and surgeons, physicians and other practitioners cooperated and contributed to the fortunes of two newly-established practices, anatomy and chemistry. Tulp played a major part on the urban scene, also through providing an austere and moral meaning to his highly attended, almost fashionable, anatomical lessons. Cook argues that René Descartes himself - who, in his opinion, was a Dutch more than a French philosopher - was deeply influenced by medical and anatomical research that shaped his later works, and especially the one on the passions of the soul, where he attempted to match the standards he had learned to appreciate in the Netherlands. Moving to the Dutch colonies of the far East, in one of the best chapters in the book - where the vicissitudes of the physician and natural philosopher Jacobus Bontius are paralleled by those of his foremost patient, Jan Pietersz. Coen - Cook offers a vivid picture of the cruelties and miseries involved in the 'heroic age' of commercial colonialism. The lives of the VOC employees were constantly under threat, because of diseases, long journeys by sea, and commercial wars; but nothing compares with the sufferings imposed on natives, whether friendly or unfriendly to the Westerners. Against this often dark backstage, the question of credibility and the very collection of information and specimens assume a different meaning. Bontius' complicated life, and his 'afterlife', embodied in the vicissitudes of his manuscripts on the natural history of the Far East, epitomize the difficulties and achievements of scientific research in this environment.

At mid-century new issues emerged, connected with the trade and interest in *naturalia* and the commercial activity in the Far East. The advances in anatomy triggered a new interest in the preservation of corpses and organic parts, both at scientific and at public level. The 'hero' of the seventh chapter, Louis De Bils, is no physician nor

surgeon, but a rich gentleman who developed a much sought after 'secret' technique for embalming, which allowed him to obtain a wide audience. His relationship to the medical community was at times difficult - while a friend of Franz de le Boe Sylvius and Paulus Barbette, he was strongly opposed by Heurnius, a prominent anatomist at Leiden. Jan Swammerdam, better known for his microscopic investigations, also carried out his own attempts at preserving bodies, building a rich cabinet of curiosities. Cook connects the advance in anatomy to other industrial achievements in the Netherlands - especially in the bleaching industry, which also relied on "the development of material techniques for probing phenomena" (p. 293).

The end of the century saw an increase in the demand for *naturalia* from the Indies, and also the creation of new gardens, in the motherland as well as abroad; difficulties in transporting and acclimatizing species were overcome by a constant effort. The eighth chapter illustrates the lives and work of Dutch naturalists moving East - among them Andreas Cleyer, an apothecary and the director of the medical shop of the VOC in Batavia; Georg Everhard Rumphius, the 'Pliny of the Indies'; Maria Sibylla Merian, an artist and illustrator of *naturalia*, and an outstanding example of early female and family entrepreneurship. However, the most fascinating story of this period, and arguably of the whole book, is the one of Willem ten Rhijne, a young doctor from the Leiden school of medicine. He was hired in the 1670s by the VOC to meet the request of the Japanese political élite demanding a European physician who could speak to Japanese doctors and learned persons, and discuss Western medicine with them. From the tightly controlled and sealed off artificial island of Deshima, in the harbour of Nagasaki - the only place in Japan where the Dutch were allowed to stay - ten Rhijne made journeys to Edo and discussed at length with Japanese colleagues, or with interpreters and even spies. Despite the obvious difficulties and misunderstandings, this episode of linguistic and broadly cultural translation

and exchange - ten Rhijne also profited from his partners' medical expertise - well illustrates the possibilities of cultural cross-fertilization entailed in the commercial and trading ventures to the Far East. The tenth and concluding chapter, devoted to the 'refusal' of a speculative attitude embodied in Hermann Boerhaave, represents at the same time the conclusion of the book, and the opening to the wider European context.

The book is highly readable and enjoyable; it provides a good basic information and it is thus suitable for a wide readership. However, it would have greatly benefited from careful editorial care. The Italian reader will be surprised by the multiple identities taken up by Tommaso Campanella, who becomes Thomaso at p. 241 and Thomas in the Index; the same for Giorgio (not Georgio, p. 409) Baglivi; as for the *Collegio della sapienza,* to whom the latter is associated, such an instititution never existed, while the Latin name of Rome University was *Studium Sapientiae*. Despite these and other minor slips, this book is a highly ambitious attempt to deeply revise common assumptions on early modern science as a merely intellectual enterprise, characterized by the increasing use of mathematics, geometry, and other specific languages, or as the concern of élites gathering in highly specialized institutions where objects were disembodied - meant for experimentation - to be re-constructed and placed in a space of neutrality. On the contrary, Cook willingly "runs the risk" (p. xiii) of calling material objects, and indeed materialism itself, at the forefront of his interpretation of early modern medicine and science, implying that it was their very materiality, not their abstract qualities, that enabled their research, acquisition, fruition, and finally their classification in an order of ideas that today we call "scientific".

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