A Review of Andreas Blank's "Biomedical Ontology and the Metaphysics of Composite Substances, 1540-1670" (Munich: Philosophia Verlag 2010)

By Ohad Nachtomy
For Philosophy in Review

What exactly was the impact of the scientific revolution, the transition from the old (Aristotelian) science to the new (Cartesian) science, on the life sciences? In particular, how did the scientific revolution changed the way the new philosophers, chemists, and physicians perceived living things and the phenomena of life? The scientific revolution is usually considered in the context of physics, astronomy, and mathematics. It is rarely considered in the context of the life sciences (though recently things begin to change in this regard). It is well known that Descartes rejected the Aristotelian definition of living things in terms of their active souls and substantial forms as the principles of life and the cause and explanation of their nature. It is also well known that Descartes has in fact rejected the very category of living beings as uninformative for what he regarded as a scientific explanation of extend things. Instead, he attempted to produce a mechanistic explanation of the so called phenomena of life in terms of matter in motion and the position of organs within natural machines. It is quite plain that this rough statement, though generally true, captures only a very small part of a very complex story – a story of mixed positions whose details still remain to be exposed.

In his recent book, Andreas Blank has undertaken to uncover some important and little known aspects of this complex story. In doing so, he shows that the picture illustrated above, a picture of a straightforward rejection of Aristotelianism and its supposed replacement by the mechanistic vision of science, is indeed a gross simplification, if not outright false.

In particular, Blank "explore[s] early modern theories of composite substances and their relevance to early modern views on the nature of plants and animals (both human and non-human). He investigates "the question of the unity of a living being, the analysis of ontological categories relevant for describing biological reproduction, the question of the nature and mutability of biological species, the analysis ontological categories relevant for describing diseases, and the question of the relation between living beings and divine causation. The main focus of this volume is on thinkers that are paradigmatic as transitional figures—as figures that are revealing […] the complex process by means of which non-mechanistic medieval conceptions of the structure of living beings were superseded by mechanistic conceptions of the structure of living beings in the 17th century."

Blank's decision to focus on such transitional figures – that is, in between late Aristotelians and early mechanists – is a very wise one. His studies show that the dichotomy between Aristotelians and mechanists oversimplifies a much more complex

reality. In particular, the studies in this book demonstrate that the views of many thinkers in this period were often a mixture of a complex versions of Aristotelian metaphysical commitments reshaped and reworked by new empirical discoveries in medicine and physiology, as well as by the challenges posed by the revival of materialism, atomism and mechanism.

Even more important is the fact that most figures Blank investigates were mainly left out of the front line of research (not to say entirely neglected, in some cases) but, as he shows, have much to teach us about the complex positions and presuppositions that many thinkers and practitioners in fact held and, in this way, have much to teach us about the background for the emergence of the life sciences in modern science.

The main heroes in Blank's book are the sixteenth-century philosopher and physician Julius Caesar Scaliger (1484-1558), the medical writings of Jean Fernel (1497-1558), the Padua-based philosopher and physician, Fortunio Liceti (1577-1657), the Venice-based physician Emilio Parisano (1567-1643), the English natural philosophers, Kenelm Digby (1603-1665) and Walter Charleton (1619-1707), the Danish Royal physician Petrus Severinus (1540/2-1602), the Wittenberg physician and philosopher Daniel Sennert (1572-1637), and, finally, the more familiar G. W. Leibniz.

In the first chapter, Blank studies "the relationship between corpuscularian and Aristotelian strands in Julius Caesar Scaliger's theory of composite substances; in the second chapter, he investigates the implications of Scaliger's account of subordinate and dominant substantial forms for the question of the constancy of biological species; in the third chapter the focus shifts to Jean Fernel's views of Simple Forms, Composite Substances, and Divine Immanence. In chapter 4, Blank presents some lines of continuity between Late Aristotelian and Cartesian embryology. Through the cases of Liceti and Emilio Parisano (1567-1643), Blank shows that in both traditions one finds the view that imagination fulfils a causal role in trait acquisition. In chapter 5, Blank discusses the natural philosophy of Kenelm Digby and argues that it is highly eclectic. Blank argues that, while Digby's views involve crucial steps toward a mechanistic views of living being (such as doing away with substantial forms) they also incorporate elements of Late Aristotelian mixture theory and that Aristotelian conceptions of rarity, density, and homogeneity also appear in Digby's theory of animal generation. Chapter 6 examines the theory of animal generation, developed by the most prominent advocate of atomism in England, Walter Charleton. Blank argues that, Charleton, like Digby, in spite an attempt for an atomist and reductionist account of living beings, re-admits immaterial rational souls into his ontology. Chapter 7 reveals interesting connections between the medical conception of poison-induced epilepsy and the ontological conception of a plurality of substantial forms in living beings in the work of Daniel Sennert. Chapter 8 discusses similarities and dissimilarities between the conceptions of composite substance in Sennert and the early Leibniz.

Blank's discussion of these divers topics is justified as follows: "The issue of unity and individuation of living beings makes the metaphysics of composite substances central for other ontological issues relating to early modern medical and biological thought.

Obviously, once the structure of living beings was described in a way that the dominant substantial form accounts for the unity of a living being while the subordinate forms account for the individuality of its components, questions of biological reproduction, of species mutability, of the nature of diseases, and even of the role of divine causation always involved a clarification of the role of the various substantial forms contained in an organism (19-20)."

This is indeed the case and a very fertile field of investigation. Perhaps the best example of this is the question whether the cause of disease is a particular form or whether it must be a disease that infects the whole substance through its (dominating) substantial form (see pp. 169-171). This debate also exemplifies a related question, namely the presupposition of subordinate forms and the relations between the dominant form (of the whole substance) and its subordinate ones. Are diseases such as epilepsy and the effect of poisons caused by disruption of the whole substance by inimical forms or are they caused by some conflict between the various forms of the substance? As one can easily see, this question has fascinating implications, both philosophical and medical. Since I have no space to go into the details here I must refer the reader to chapter 7 of Blank's for a very interesting discussion of these questions.

Blank's discussion of Sennert on dominant and subordinate forms in chapters 8 (which draws on his early discussion of Scaliger) is a good example of how a study of less known figures can reveal essential parts of the background for the views of better known thinkers such as Leibniz. Here I think of what often seemed to me like a strange view of Leibniz's, namely that there could be a complex hierarchy of forms, some dominate and some subordinate, in the structure of a living being. Blanks' discussion of Scaliger, Fernel, and especially Sennert, does much to shed light on Leibniz's view and make it seem less surprising. I regret, however, that Blank does not further develops the question of how this bears on Leibniz's position. This is certainly a point that is worth pursuing elsewhere.

In investigating some little explored territories, Blank's book is a very significant contribution to the growing interest in the life sciences in the early modern period. Blank makes a very substantial contribution to this field by exposing and carefully examining the metaphysical background that informed much of the development in this period. In his own words, this study shows the "vitality of early modern Aristotelianism", a term Blank aptly borrows from Mercer (203).

The book has a great value as it is but let me close by pointing out some ways in which further research might advance and improve on the present work. The book does not have (and does not pretend to have) an overall thesis. This is not necessarily a deficiency. I think that it is better read as a series of chapters united through a broad theme and interest in what Blank calls Biomedical ontology. I would prefer to call this the intersection between late Aristotelian metaphysics and early life science – but the name makes little difference. My main reservation about of Blank's project is this: since the main contribution of these chapters lies in the points of detail they bring out, the non-specialist reader, such as myself, feels at times that they are too thin in the texts and details they

provide. In other words, the author assumes that his readers would be familiar with his sources. My sense, though, is that a good part of the readers of this review would be unfamiliar with some of the objects of Blank's chapters, not to mention their original texts. Thus, I think that more a detailed and richer textual exposition and more citations could make this work more accessible and valuable for a broader audience. It goes without saying that Blank's translations and presentation of these thinkers is itself of great value. But for this reason, the chapters could benefit from more introductory background about the authors and the debates they were engaged in. In addition, a more extensive conclusion would help to guide the reader through the intricate and marvelous details presented in each chapter. In spite of these minor points I think the book reveals new themes and new vistas for further research and is a must read for anyone interested in understanding the historical background for the life sciences in the 16^{th} and 17^{th} centuries.