marks an epoch equally in the science of organic chemistry proper and in the life-work of Liebig. The necessity of collecting and systematising the scattered labours of chemists and physiologists in this department was simultaneously felt in France, where Liebig's friend and rival, Dumas, published his 'Essai de Statique chimique des Êtres organisés' as a conclusion to his course of

Liebig broke through the barriers which in his age separated science in Germany from general culture, and the university professor from the man of the world. From France he learnt the merit of a clear style, and from England the higher art of popularisation. His fame did not grow slowly and surely like that of Helmholtz, spreading almost imperceptibly from narrower into ever wider circles: he took the world by surprise, and stirred up everywhere inquiry, opposition, and controversy. He ventured on great and sweeping generalisations and on daring experiments and prophecies, with the result that in the final establishment of truth his opponents had frequently as great a share as himself. Notable instances are his so-called "mineral theory" of manuring and his theory of fermentation. Through the former the great division which separated the processes in the living from those which obtained in the inanimate (mineral) world was broken down; and through the latter the modern notions of the ubiquity and continuity of life were to a large extent established, as will be seen in the sequel of this chapter. The correct notions which he entertained as to the necessity of the mineral ingredients (phosphoric acid, lime, potash, &c.) in plant-manures, which he started in opposition to the older "humus" or "vegetable mould" theory, was on the point of being refuted by his insistence on making his chemical fertilisers insoluble, ignorant as he then was of the absorbing and retaining function of mould; but, a generation after, the prevailing predilection for soluble manures was again much modified by the introduction of the "Thomas slag," and the enormous improvements in the process of extreme pulverisation. Prof. Vogel in his above-mentioned address gives many extracts from Liebig's writings, referring to the final and corrected expression of the chemical theory of fertilisation. These are so characteristic of Liebig's habit of thought and his whole mental attitude, that I transcribe them: "When I knew the reason why my fertilisers would not act, I felt like a man who had received a new life, for through this all processes of agriculture were explained, and now that the law is known and lies clearly before our eyes, there remains only the wonder that we did not see it long ago: but the human mind is a queer thing,—what does not fit into the circle of ideas once given, does not exist for it. . . . I had sinned against the wisdom of the Creator, and for this had received merited punishment. I wanted to improve His work, and in my blindness I thought that in the wonderful chain of laws which bind life to the surface of the earth, one link was missing which I, a helpless worm, could supply" (*loc. cit.*, p. 34).