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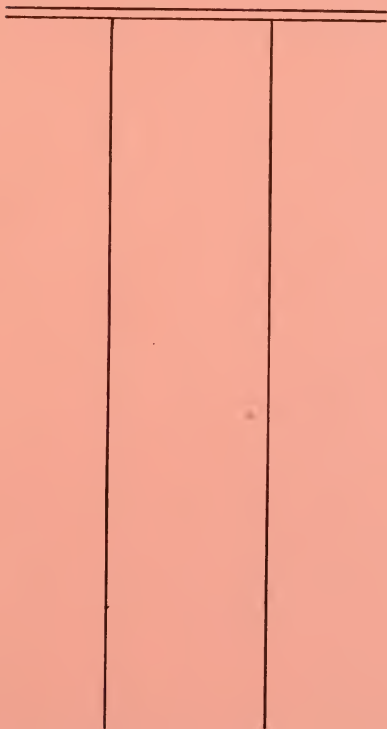


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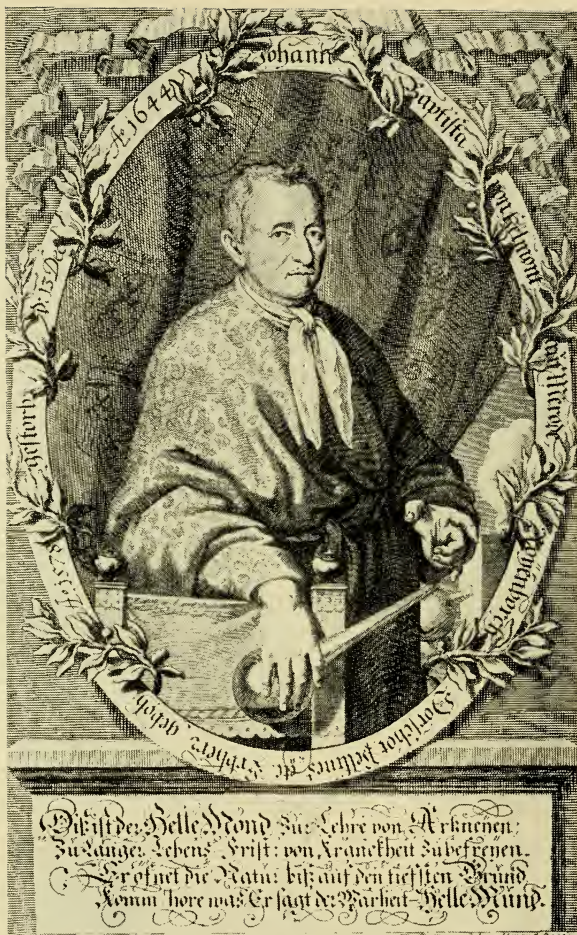
**JOANNES BAPTISTA
VAN HELMONT**

WORKS BY H. STANLEY REDGROVE,
B.Sc. (Lond.), F.C.S.

- ON THE CALCULATION OF THERMO-CHEMICAL CONSTANTS. (Arnold, 1909, 6s. net.)
- MATTER, SPIRIT AND THE COSMOS: SOME SUGGESTIONS TOWARDS A BETTER UNDERSTANDING OF THE WHENCE AND WHY OF THEIR EXISTENCE. (First published 1910. Popular Edition, Rider, 1916, 1s. net.)
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JOANNES BAPTISTA VAN HELMONT

CHAPTER I

THE PARACELSIAN REFORMATION OF MEDICINE

IN the early part of the sixteenth century there began to be accomplished in the world of medicine a revolution in many ways similar to that which was taking place at the same time in the domain of religion and theology, and with results not less (nay, perhaps even more) beneficial to posterity. Just as the forces which achieved the reformation of the Church came to a focus and found effectual expression in the work of one man, to wit Martin Luther, so, too, did those which accomplished the reformation of medicine. Their focal point was the master-mind of Paracelsus (1493-1541). In the past—throughout the later Middle Ages—thought had been based on authority and fettered by tradition; and, just as none dared question the teaching of Aristotle in philosophy, so none dared question that of Galen and Avicenna in medicine. Truly, these men were three of the world's master minds, and their works are permanent monuments to the majesty of man's thought. But not by blind

reliance on the work of the past was the conquest of Nature by man to be achieved. Philosophy had stagnated into scholasticism ; the state of medicine was similar, and a revolution was necessary if progress was ever to be made.

Strictly speaking, there was no science of chemistry in the modern meaning of the term prior to the time of Robert Boyle (1626-1691), who first defined a chemical element as it is now understood. But, in the wider meaning of the term, chemistry goes back to prehistoric times, and we may with a fair degree of accuracy divide its history into four periods, the third of which Paracelsus initiated. Chemistry and medicine necessarily have always been and must always remain in close association. Paracelsus fused them into a whole, to the benefit of both. In its earliest days chemistry was purely technological : the term may be taken to cover such crafts as those of the smelter, the dyer and the pharmacist. The second period of its history was that of alchemy,¹ when, under the impetus of a mystical theory of the Universe, which likened the metals to man and accepted analogy as its guiding light, men sought for the Philosopher's Stone, which would endow them with youth and transmute all base metals into gold, thus achieving in the physiological and mineralogical worlds a work analogous to that of the spirit of Christ in the heart of man. Under this

¹ For a full account of alchemy in all its bearings see H. S. Redgrove's *Alchemy : Ancient and Modern* (Second Edition, London, 1922), and *Bygone Beliefs* (London, 1920).

impetus much experimental work of a chemical nature was done, and many valuable discoveries were made, but on the whole the alchemical hypothesis tended rather to circumscribe the sphere of chemical research and to limit its outlook and aims.

Paracelsus taught that the primary object of chemistry was the preparation of drugs—their purification and the discovery of new ones. His theory of the three principles—salt, sulphur and mercury—which he believed to be present in all things, good health in man being due to their right proportion, disease to their disproportion, does not seem to the modern mind very different from Galen's doctrine of four humours corresponding to the four Aristotelian elements, namely, blood, corresponding to air, phlegm to water, choler to fire and black choler to earth, which, according to him, cause sickness and health in much the same way. But the difference of vital and supreme importance was that his theory led Paracelsus to seek for chemical remedies. Galen was content with herbs and minerals in their crude state; Paracelsus sought to purify them and to extract their quintessence. Both as a teacher and as a physician, Paracelsus, in spite of most vigorous opposition, was remarkably successful. His followers, that is to say, those who believed in the union of chemistry and medicine and approached the science in the free Paracelsian spirit, without necessarily accepting all Paracelsus's peculiar doctrines—some of which are very fantastic—are usually known as

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the iatro-chemists, and their work constitutes the third period in the history of chemistry. But it must not, however, be supposed that, because a new impetus had been given to chemical research, the doctrines of alchemy were discarded. Practically all the iatro-chemists, including Paracelsus himself, believed in the possibility of transmutation. Many of them essayed to achieve it, and two or three claimed to have been successful. During the century and a half which separates Paracelsus from Boyle, both chemistry and medicine made rapid progress, and their union strengthened both of them. Thenceforward it became possible for each science to travel along its own path towards its own individual perfection.

Of the iatro-chemists there is none greater than Joannes Baptista van Helmont, who may justly be termed the greatest chemist of his own, or of any preceding, age. Writing of him, Professor E. von Meyer remarks that he was—

“ One of the most eminent and independent chemists of his time. Endowed with rich acquirements and experiences in medicine and chemistry, he surpassed those of his contemporaries who laboured in the same field . . . he fought against the old medical system, and materially contributed by his brilliant services in bringing about its fall. Without van Helmont, iatro-chemistry would never have attained to the height to which it was subsequently raised by Sylvius and Tachenius. In addition, he enriched pure

chemistry by a very great number of valuable observations.”¹

Dr. J. A. Mandon, who is equally competent to judge, writes concerning him :

“J. B. van Helmont was the greatest figure in medicine of modern times. He reminds us of both Hippocrates and Aristotle. Medicine never had so penetrating an observer nor so profound a thinker.”²

But van Helmont was not only a chemist and physician, he was also a philosopher and mystic—in the widest sense of the term, a man of wisdom. Moreover, it is interesting to note, he was not merely an alchemist, but one of those who claimed to have carried out the transmutation of base metal into gold. His life is interesting, not only because the life of every great man is interesting, but because it shows us—as do the lives of so many of the martyrs of science—the conflict of light with darkness, of free enquiry with tradition, of truth with dogmatism, of love with hate.

¹ Ernst von Meyer : *A History of Chemistry from Earliest Times to the Present Day*. Trans. by George McGowan (Third Edition, London, 1906), pp. 80 and 81.

² J. A. Mandon : “J. B. van Helmont, sa Biographie,” etc., *Mémoires des Concours et des Savants étrangers, publiés par l'Académie Royale de Médecine de Belgique*, tome vi (Bruxelles, 1866), p. 555.

CHAPTER II

VAN HELMONT'S OWN ACCOUNT OF HIS EARLY LIFE AND STUDIES

JOANNES ¹ BAPTISTA VAN HELMONT was born in Brussels in 1577. He was the youngest child of his parents, and through his mother, Marie de Stassart, was descended from one of the most illustrious families of Brabant. During his lifetime he published few works, but upon his death, the main body of his writings was published by his youngest son, Franciscus Mercurius van Helmont, under the title of *Ortus Medicinæ* (Amsterdam, 1648).² This book was translated into English by John Chandler, under the title of *Oriatrike, or Physic Refined*, and was published in London in 1662, being reissued in 1664 with the new name of *Van Helmont's Workes*. It

¹ Or, Jan.

² It was reissued several times. Mention may here be made of three early works by van Helmont, which were discovered in the middle of the last century and published for the first time by C. Broeckx. Of these, one, published in the *Annales de l'Académie d'Archéologie de Belgique*, tome x (Antwerp, 1853), pp. 327-92, bears the title, "Eisagoge in artem medicam a Paracelso restitutam," whilst the others are commentaries on two of the books of Hippocrates. Particulars of the works of van Helmont published during his lifetime will be found in the next chapter.

was also translated into several other languages. In Chapter II the author gives an interesting autobiographical sketch of how he was led to become a physician, which forms practically the sole authority for most of the details of his early life. Rather than paraphrase it, it seems to us more interesting to give the account in the quaint English of the first translator, which is as follows :

“ In the year 1580, the most miserable one to all *Belgium*, or the Low Countries, my Father died. I being the youngest, and of least esteem of my Brethren and Sisters. For I was brought up in Studies. But in the year 1594 I had finished the course of Philosophy, which year was to me the seventeenth. Therefore since I had onely a Mother, I seemed at *Lovaine* to be made the sole disposer of my Right and Will. Wherefore I saw none admitted to Examinations, but in a Gown, and masked with a Hood, as though the Garment did promise Learning ; I began to know, that Professors for sometime past, did expose young men that were to take their degrees in Arts, to a mock : I did admire at the certain kinde of dotage in Professors, and so in the whole World, as also the simplicity of the rash belief of young men. I drew my self into an account or reasoning, that at leastwise I might know by my own judgement, how much I was a Phylosopher, I examined whether I had gotten truth, or knowledge.

“ I found for certainty, that I was blown up

with the Letter, and (as it were the forbidden Apple being eaten) to be plainly naked, save, that I had learned artificially to wrangle. Then first I came to know within my self, that I knew nothing, and that I knew that which was of no worth. For the Sphere in natural Phylosophy, did seem to promise something of knowledge, to which therefore I had joyned the Astrolobe, the use of the Ring or Circle, and the speculations of the Planets. Also I was diligent in the Art of *Logick*, and the Science Mathematical, for delights sake, as often as the reading of other things had brought a wearisomeness on me.

“Whereto I joyned the Elements, or first Principles of *Euclide*; and this Learning, I had made sociable to my Genius or natural wit, because it contained truth; but by chance, the art of knowing the Circle of *Cornelius Gemma*, as of another Metaphysick, came to my hand. Which, seeing it onely commended *Nicholas Copernicus*, I left not off, till I had made the same familiar unto me. Whence I learned the vain excentricities, or things not having one and the same Center, another circular motion of the Heavens: and so I presumed, that whatsoever I had gotten concerning the Heavens, with great pains, was not worthy of the time bestowed about it.

“Therefore the Study of Astronomy, was of little, or no account with me, because it promised little of certainty or truth, but very many vain things. Therefore having finished my Course, when as I knew nothing that was sound, nothing

that was true, I refused the Title of Master of Arts; being unwilling that Professors should play the fool with me, that they should declare me Master of the seven Arts, who was not yet a Scholar. Therefore I seeking truth, and knowledge, but not their appearance, withdrew my self from the Schooles.

“A wealthy Cannonship was promised me, so that I would make my self free to Theology or Divinity; But *S. Bernard* affrighted me from it, because I should eat the sins of the people. But I begged of the Lord Jesus, that he would vouchsafe to call me thither, where I might most please him. For it was the year, wherein the Jesuites had begun to teach Philosophy at *Lovaine*, the King, Nobles, and University, being against it; and that thing, together with them, was forbidden by *Clement* the Eighth. But their Scholars aspiring to their Degree, they had assembled them to the School-houses; but others, and the more rich, they did allure with the pleasant Study of Geography: and one of the Professors, *Martine del Rio*, who first being the Judge of *Turma* in *Spain*, and afterwards wearied in the Senate of *Brabant*, being allured to the Society, and had resorted thither also, did expound the disquisitions, or diligent examinations of Magick. Both the Readings I greedily received. And at length, instead of a Harvest, I gathered onely empty stubbles, and most poor patcheries, void of judgement.

“In the mean time, least an houre should vanish away without fruit, I rub'd over *L.*

Annæus Seneca, who greatly pleased me, and especially *Epictetus*. Therefore I seemed, in moral Philosophy, to have found the juyce of truth: and then presently I thought, this was that for which *Pythagoras* might require the strict Silences of so many years, an excellent judgement, and therefore notable obedience. At length, a few years being changed, I saw a *Capuchin* to be a Christian Stoick. Indeed Study for Eternity, smiled on me; but for so great austereness, my more tender health was a hinderance. I prayed the Prince of life divers times, that he would give strength, whereby I might contemplate of the naked truth, and immediately love it. *Thomas of Kempis*, increased this desire in me, and afterwards *Taulerus*. And when I presumed, and certainly believed, that through Stoicisme, I did profit in Christian perfection, at length, after some stay and weariness in that exercise, I fell into a Dream.

“I seemed to be made an empty Bubble, whose Diameter reached from the Earth even to Heaven: for above hovered a flesh-eater; but below, in the place of the Earth, was a bottomless pit of darkness. I was hugely agast, and also I fell out of all knowledge of things, and my self. But returning to my self, I understood by one conception, that in Christ Jesus, we live, move, and have our being. That no man can call even on the name of Jesus to Salvation, without the special grace of God. That we must continually pray, *And lead us not into temptation, &c.* Indeed, understanding was given unto me, that

without special grace, to any actions, nothing but sin attends us. Which being seen, and favourily known, I admired my former ignorances; and I knew, that Stoicisme did retain me an empty and swollen Bubble, between the bottomless pit of Hell, and the necessity of imminent death. I knew I say, that by this Study, under the shew of moderation, I was made most haughty: as if trusting in the freedom of my will, I did renounce divine grace, and as though, what we would, we might effect by our selves. Let God forbid such wickedness, I said. Wherefore I judged, that Blasphemy to be indulged by Paganisme indeed; but not to become a Christian: and so I judged Stoical Philosophy, with this Title, hateful. In the mean time, when I was tired, and wearied with the too much reading of other things, for recreation sake, I rouled over *Mathiolus* and *Diascorides*, thinking with my self, nothing to be equally necessary for mortal men, as by admiring the grace of God in Vegetables, to minister to their proper necessities, and to crop the fruit of the same.

“Straightway after, I certainly found, the art of Herbarisme to have nothing increased since the dayes of *Diascorides*; but at this day, the Images of Herbs being delivered, with the names and shapes of Plants, to be on both sides onely disputed: but nothing of their properties, virtues and uses, to have been added to the former invention and Histories: except that those who came after, have mutually feigned degrees of

Elementary qualities, to which the temperature of the Herbe is to be attributed. But when I had certainly found, happily two hundred Herbes, of one quality and degree, to have divers properties, and some of divers qualities and degrees, to have a Symphony or Harmony (suppose it in vulnerary or wound potions) in producing of the same effect; not indeed the Herbs (the various Pledges of divine Love) but the Herbarists themselves began to be of little esteem with me: and when I wondred at the cause of the unstableness of the effects, and of so great darkness in applying and healing: I inquired whether there were any Book, that delivered the Maxims and Rules of Medicine? For I supposed, Medicine might be taught, and delivered by Discipline, like other Arts and Sciences, and so to be by tradition: but not that it was a meer gift.

“ At leastwise, seeing Medicine is a Science, a good gift coming down from the Father of Lights, I did think, that it might have its Theoremes and chief Authours, instructed by an infused knowledge, into whom, as into *Bazaleel*, and *Aholiah*, the spirit of the Lord had inspired the Causes and knowledge of all Diseases, and also the knowledge of the properties of things. Therefore I thought these enlightened men to be the Standard-defending Professors of healing. I inquired I say, whether there were not another, who had described the Endowments, Properties, Applications and proportions of Vegetables, from the *Hyssop*, even to the Cedar of *Libanus* ?

“ A certain Professor of Medicine answered me, none of these things might be looked for in *Galen* or *Avicen*. But since I was not apt to believe, neither did I finde, among Writers, the certainty sought for, I suspected it according to truth, that the giver of Medicine would remain the continual dispenser of the same. Therefore I being carefull and doubtfull, to what Profession I should resign my self, I had regard to the manners of the People, and Lawes, and pleasures of Princes ; I saw the Law to be mens Traditions, and therefore uncertain, unstable, and void of truth : For because in humane things there is no stability, and no marrow of knowledge, I seemed to passe over an unprofitable life, if I should convert it to the pleasures of men.

“ Lastly, I knew, that the government of my self, was hard enough for me ; but the judgement concerning good men, and the life of others, to be dark, and subject to a thousand vexatious difficulties : wherefore I wholly denied, the Study of the Law, and government of others. On the other hand, the misery of humane life was urgent, and the will of God, whereby every one may defend himself so long as he can ; but I more inclined with a singular greediness, unto the most pleasing knowledge of natural things ; and even as the Soul became Servant to its own inclinations, I unsensibly slid, altogether into the knowledge of natural things. Therefore I read the Institutions of *Fuchius*, and *Fernelius*, whereby I knew that I had lookt into the whole Science of Medicine, as it were by an Epitome,

and I smiled to myself. Is the knowledge of healing thus delivered, without a Theoreme and Teacher, who hath drawn the gift of healing from the Adeptist? Is the whole History of natural properties, thus shut up in Elementary qualities? Therefore I read the works of *Galen* twice, once *Hipocrates* (whose Aphorismes I almost learned by heart) and all *Avicen*, and as well the *Greeks*, *Arabians*, as *Moderns*, happily six hundred, I seriously, and attentively read thorow, and taking notice by common places, of whatsoever might seem singular to me in them, and worthy of the Quill. At length, reading again my collected stuffe, I knew my want, and it grieved me of my pains bestowed, and years: When as indeed I observed, that all Books, with institutions, singing the same Song, did promise nothing of soundness, nothing that might promise the knowledge of truth, or the truth of knowledge.

“In the mean time, even from the beginning I had gotten from a Merchant, all simples, that I might keep a little of my own in my possession, and then from a Clark of the Shops, or a Collector of simples, I had all the usual Plants of our Countrey; and so I learned the knowledge of many by the looks of the same. And also I thorowly weighed with my self, that indeed I knew the face of Simples, and their names: but, than their properties, nothing lesse.

“Therefore I would accompany a practising Physitian, straightway it repented me again, and again, of the insufficiency, uncertainty, and conjectures of healing. I had known indeed,

problematically, or by way of hard question, to dispute of any Disease, but I knew not how to cure the very pain of the Teeth, or scabbedness, radically.

“Lastly, I saw that Fevers and common Diseases were neither certainly, nor knowingly, nor safely cured; but the more grievous ones, and those which cease not of their own accord, for the most part were placed into the Catalogue of incurable Diseases. Then it came into my minde, that the art of Medicine, was found full of deceit, without which, the *Romanes* lived happily, five hundred years. I reckoned the *Greeks* art of healing to be false: but the Remedies themselves, as being some experiments, no less to help without a Method: than that the same Remedies, with a Method, did deceive most. On both sides, I discerning the deceit and uncertainty of the Rules of Medicine in the diversities of the founders of Complexions, I said with a sorrowful heart. Good God! *how long wilt thou be angry with mortal men?* who hitherto hast not disclosed one truth, in healing, to thy Schooles? how long wilt thou deny truth to a people confessing thee? needful in these dayes, more than in times past? Is the Sacrifice of *Moloch* pleasing to thee? wilt thou have the lives of the poor, Widows, and Fatherless Children, consecrated to thy self, under the most miserable torture, of incurable Diseases, and despair? How is it therefore, that thou ceasest not to destroy so many Families, through the uncertainty and ignorance of Physitians? I fell

withall on my face, and said, *Oh Lord, pardon me, if favour towards my Neighbour, hath snatched me away beyond my bounds. Pardon, pardon, Oh Lord, my indiscreet Charity; for thou art the radicall good of goodness it self. Thou hast known my sighes, and that I confess, that I am, know, am worth, am able to do, and have nothing, that I am poor, naked, empty, vain: give O Lord, give knowledge to thy Creature, that he may very affectionately know thy Creature, himself first, other things besides himself, for thy Command of Charity, all things, and more than all things, to be ultimately in thee.*

“Which thing, when I had earnestly prayed from much tiresomness, and wearisomness of minde, by chance I was led into a Dream, and I saw the whole Universe, in the sight or view of truth, as it were some *Chaos* or confused thing, without form, which was almost meer nothing. And thence I drew the conceiving of one word; which did signifie to me, what followes. Behold thou, and what things thou seest, are nothing; whatsoever thou dost urge, is lesse than nothing it self, in the sight of the most high. He knowes all the ends or bounds of things to be done; thou at leastwise mayst apply thy self to thy own safety. Yea in that Conception, was there an inward Precept, that I should be made a Physitian, and that at sometime, *Raphael* himself should be given unto me. Forthwith therefore, and for thirty whole years after, and their nights following in order, I laboured, to my cost, and dammage of my life, that I might obtain the

Natures of Vegetables and Mineralls, and the knowings of their properties. The mean while, I lived not without prayer, reading, narrow search of things, sifting of my Errours, and daily experiences written down together. At length, I knew with *Salomon*, I had for the most part hitherto perplexed my Spirit in vain, and vain to be the knowledge of all things, which are under the Sun : vain are the searchings out of Curiosities. And whom the Lord Jesus shall call unto Wisdom, He, and no other shall come ; yea, he that hath come to the top, shall as yet be able to do very little, unless the bountiful favour of the Lord shall shine upon him. Loe, thus haue I waxed ripe of age, being become a man, and now also an old man, unprofitable, and unacceptable to God, to whom be all Honour.”¹

¹ In all the quotations from *Oriatrike*, the spelling, punctuation, and use of capital letters and italics of the original have been preserved.

CHAPTER III

TRAVELS AND TRIALS

IN the previous chapter we have learned how van Helmont decided to devote his life to medicine, and how he had prepared himself for the task by the study of the various sciences of his day, more especially botany and the medical authors then in repute. But he was destined to meet with many disappointments, and not to achieve satisfaction in this resolve, until he had broken entirely with traditional teaching and had learned to rely only upon his own observations, and the intuitions of his own original mind.

At an early age he was appointed to deliver a course of lectures on surgery at the College of Medicine in Louvain. According to his own statement these lectures were delivered when he was only seventeen¹; but this seems improbable in view of the fact—as stated by him—that he had at this time only just completed his philosophical studies; and, with M. Rommelaere,²

¹ "Tumulus Pestis," ch. i, *Oriatrike*, p. 1078.

² See Dr. W. Rommelaere's "Études sur J. B. van Helmont," *Mémoires des Concours et des Savants étrangers*, publiés par l'Académie Royale de Médecine de Belgique, tome vi (Brussels, 1866), pp. 287 *et seq.* This work contains a very minute biography of van Helmont, which we have

we are inclined to put the giving of these lectures at some date soon after 1599, when van Helmont says that he graduated Doctor of Medicine of the University of Louvain.¹ Van Helmont, in his works, emphasised the importance of surgery and deplored the neglect of it by the physicians of his day. He realised that the genuine man of science ought not to be ashamed to use his hands, and in later years devoted considerable time to anatomy—carrying out many dissections, not (in the Galenical style) of animals only, but of the dead bodies of men and women—whereby he was able to gain considerable information concerning the nature of disease. Van Helmont, however, was disappointed with his lectures, because his knowledge of surgery at that time was based merely upon the information gained by the reading of books, and he almost gave up the profession of medicine in despair.

It would appear to be some little while after this that he was so unfortunate as to contract the scabies or itch, through shaking hands with a lady who was afflicted with the disease. We have said that he was unfortunate, but, as the sequel will show, the event bore goodly fruit both for van Helmont and the science of medicine. Two of the more famous physicians of his city diagnosed the complaint in accordance with Galen's principles, as being due to "adust or found very useful, and to which we acknowledge our indebtedness, although it appears to us that the author dates with a greater degree of precision some of the events in van Helmont's life than the evidence would seem to warrant.

¹ "The Authours Promises," col. iii, § 7, *Oriatrike*, p. 7.

burnt choler . . . together with salt phlegm," and judged the seat of the disease to be in the liver. The orthodox Galenical remedies were applied. Naturally van Helmont was not cured : indeed he became excessively ill. The result convinced him of the falsity of the Galenical system of medicine. He considered the disease in question to be one of the skin only, and cured it himself in three months by the application of a sulphur ointment.¹

No doubt the reading of the works of Paracelsus, to whom he freely acknowledges his indebtedness,² helped to liberate van Helmont's mind from the fetters of orthodoxy in medicine ; but he can only be called a follower of Paracelsus in a limited sense of that term. Whilst his theory of the archeus, to which we shall refer later, was adapted from Paracelsus, and whilst he agreed with him in believing, for example, in the reality of sympathetic cures, many of Paracelsus's leading doctrines he rejected. He did not, for instance, accept the Paracelsian doctrine of the three principles, salt, sulphur and mercury, as the basis of all things ; nor did he agree with Paracelsus's view of man as a microcosm, thinking it more seemly to envisage man as made in the image of God. In his work on the Plague, one of his dreams is related, in which he seemed to behold the vaults of Nature, wherein

¹ "The Scab and Ulcers of the Schools," §§ 2-10, *Oriatrike*, pp. 316-319, and "An Unheard-of Doctrine of Fevers," ch. v, §§ 10-12, *ibid.*, pp. 958 and 959.

² "The Arcanums or Secrets of *Paracelsus*," *Oriatrike*, p. 802, and elsewhere.

are hidden her inmost truths. We read as follows :

“ *Galen* hath seemed to me, to have entred into the Vaults with a slender Lamp ; who being presently affrighted, stumbled in the entry, and at first almost fell over the Threshold : Therefore, his Oyl being lavishly spent, he returned to his own, and told many things confusedly, concerning the Sepulchres, which he had not perceived, nor known, nor believed, although he had seen them. . . . At length, *Paracelsus* having entred with a great Torch, fastened a small cord to the wall, about his first paces, which he might follow as a Companion, and Reducer of the wayes ; he aspiring to pierce whither the footsteps of mortals had not yet taken their journey. The rout of Birds [these being birds of night] is presently amazed at so great a light, it thinks that *Prometheus* had entred ; it dares not, nor was able to extinguish the Torch, yet it secretly attempts to do it. This man seeth very many Monuments, he is long and freely enlarged, he fills the entries with smoak, and while he is intentive, as a greedy devourer of truth, his strength fails, his Torch falls, his light is extinguished in the middle of his course, and he is as it were choaked with fumes. I a poor miserable man, have at length entred with the least light of a Lanthorn ; and that nothing might hinder, and that nothing might detain my hand from the work, I indeed refused a Rope, and hung my Lanthorn at my girdle, but a Crook followed at my back, making

a path the rule of my return : Therefore I insisting only in my own footsteps, I there saw far other things than the foregoing company of Ancestors had described.”¹

During the first few years of the seventeenth century van Helmont engaged in travel. According to M. Rommelaere, he undertook two voyages, the first to Switzerland and Italy, the second to England and other parts of the Continent. In one place in his works, he wrote that he left the Netherlands “with an intention of going far from home, of forsaking medicine, and of never returning into my Country.”² If he anticipated finding more liberal views abroad, he was destined to disappointment. Everywhere he found “the same sluggishness and ignorance,”³ and in 1605 he decided to return to his native land. On landing at Antwerp, he found that an epidemic of malignant fever was raging, in the course of which dropsy was developed, often proving fatal.⁴ If he had hesitated previously regarding his mission in life, he hesitated no longer. His sympathy with human suffering was too intense to be balked of its object. He threw himself vigorously into a contest with the disease, and had the happiness of restoring to health a large number of the afflicted persons.

In his work on the Plague, van Helmont draws the portrait of a true physician. Such a

¹ “Tumulus Pestis,” ch. i, *Oriatrike*, pp. 1074 and 1075.

² *Ibid.*, p. 1079.

³ “The Authours Promises,” col. iii, § 6, *Oriatrike*, p. 7.

⁴ “The Dropsie is Unknown,” § 11, *Oriatrike*, p. 510.

man, according to him, must be chosen by God. He writes :

“ He shall prepare, to the honour of God, his free gifts, to the comfort of his Neighbour ; and therefore compassion shall be his Leader : For he shall possess truth in his heart, and knowledge in his understanding ; Charity shall be his Sister, and the mercy of the Lord shall enlighten his ways : For he shall employ or bestow the grace or favour of the Lord, and the hope of gain shall not be in his thoughts : for the Lord is rich and liberal, and will give him an hundred-fold, in an heaped up measure. He will fructifie his works, and annoint his hands with blessing : He will fill his mouth with consolations, and with the Trumpet his word, from which diseases shall flee : He will fill his life with length of daies, his house with riches, and his Children with the fear of the Lord : His footsteps shall bring felicity, and diseases shall be in his sight, as snow in the Noon-day of Summer, in an open Valley : Curse and punishment shall flee away, and health shall follow him behind. These are the promises of the Lord, unto Physitians whom he hath chosen : These are the blessings of those, who walk in the path of mercy : Because the Lord loveth those that work mercy ; and therefore will he enlighten them by his Spirit, the Comforter. For who is liberal as the Lord, who gives many things freely, and for some small matter, bestoweth all things. Blessed is the Lord, who saves only the merciful man, and who saves him that is to be saved, freely. But consolation shall meet the merciful man, in the way

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*of hope; because he hath chosen a faithful Master."*¹

This description is no mere piece of rhetoric: it is a portrait of van Helmont himself. Previous to his leaving the Netherlands, he gave up the whole of his estates by deed of gift to his widowed sister.² He attended the poor and freely gave them medicines, asking no fee in return; and he was only persuaded to accept payment from richer patients by a confessor who urged that otherwise rich men who needed his aid would be too ashamed to ask for it.³ Both Ernest of Bavaria, Elector of Cologne, and the Emperor Rudolph II tendered him honourable and lucrative appointments; but he refused these offers, preferring to remain free to devote his time to scientific research and to healing the sick poor.⁴ Similar offers made later by Rudolph's successors met with no other response.

In or about 1609 van Helmont married, his wife being Margaret van Ranst, who was a rich heiress and daughter of William Charel van Ranst and Elizabeth de Halmale. As M. Rommelaere remarks,⁵ from all that can be gathered, the marriage was a most happy one, van Helmont's wife proving a true companion and help-meet in all his struggles and trials. Shortly after his marriage, he retired to Vilvorde and spent the

¹ "Tumulus Pestis," ch. i, *Oriatrike*, p. 1076.

² "Tumulus Pestis," ch. i, *Oriatrike*, p. 1079.

³ "Tumulus Pestis," ch. i, *Oriatrike*, p. 1079, and "Of the Disease of the Stone," ch. vii, § 3, *ibid.*, p. 873.

⁴ "Tumulus Pestis," ch. i, *Oriatrike*, p. 1079.

⁵ *Op. cit.*, p. 203.

next seven years of his life entirely in scientific research, mostly in the domain of chemistry, and in the free healing of the sick poor,¹ allowing nothing to distract him therefrom.

His attitude towards the orthodox medical doctrines of the day, and especially the success which attended the practical application of his own theories to the curing of disease, aroused the enmity of his fellow physicians, which became greatly intensified by the publication by him, at Leyden, in 1615, of a work entitled *Dageraed, oft Nieuwe Opkomst der Geneeskunst, in verborgen grondt-regelen der Natuere*, in which he ruthlessly exposed the follies of the Galenists and criticised their views in the most scathing terms. To criticise error, when it is powerful and popular, is always dangerous. He knew this, of course, but it did not deter him. No honourable method of retaliation was possible to his enemies, so they sought for one that was dishonourable. No opportunity for this, however, presented itself, until, in 1621, van Helmont published, at Paris, a treatise on the Sympathetic or Magnetic Curing of Wounds, entitled *De Magnetica vulnerum naturali et legitima curatione, contra R. P. Johannem Roberti Theologiæ doctorem Societatis Jesu*, in which he undertook to reply to two writers, Goclenius, a professor of philosophy, who had endeavoured to explain, in a weak and unsatisfactory manner in his judgment, sympathetic cures as the result of purely natural causes, and the

¹ "The Authours Promises," col. iii, § 7, *Oriatrike*, p. 7, and "Tumulus Pestis," ch. i, *ibid.*, p. 1079.

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Jesuit, Joannes Roberti, who also believed in the reality of the cures, but deemed them to be of the devil. It appears that van Helmont had written this work some years previously, at the instance of J. Roberti's brother, but without the intention of publishing it. He was afterwards persuaded to publish it by J. Roberti himself, which he did, only after it had received the approval of the ecclesiastical authorities. His enemies immediately found a large number of passages of an heretical nature in the book. As a matter of fact, van Helmont was the last man who could justly be accused of heresy. He was a pious and devout catholic, and from a modern point of view is, indeed, open to criticism for having treated the dogmas of the Church with too great deference. Thus, in one place in his works, for instance, he refused to speak of an earthquake as a movement of the earth, because the Church taught that the earth was immobile.¹ It was true, however, that in this treatise on the Magnetic Curing of Wounds—as will appear when we come to deal with the book—he trod on dangerous ground, and was so far indiscreet as to utter the very just injunction: "Let the Divine enquire concerning God, but the Naturalist concerning Nature."² The prosecutor for the ecclesiastical tribunal of Malines-Brussels, however, was very little moved by the complaint

¹ "The Trembling of the Earth, or Earthquake," § 2, *Oriatrike*, pp. 92 and 93.

² "Of the Magnetick or Attractive Curing of Wounds," § 9, *Oriatrike*, p. 761.

that was lodged against him by his enemies, and took no action in the matter.¹

But his enemies did not desist and denunciations were rained down upon him, without, however, deterring him in his determination to destroy the errors of traditionalism in medicine and to build up a sounder system of chemical and medical philosophy. In 1624 he published, at Liége, a third work, entitled *Supplementum de Spadanis Fontibus*, dealing with the properties of Spa water and, by criticising a previous writer on this subject, Henri de Heer, made for himself a fresh enemy. This year, also, saw the publication at Cologne of a second edition of *De Magnetica vulnerum*,² which F. M. van Helmont seems to suggest was the work of his enemies; the book he says was "often printed, only for the Collecting of the Stripes of Censurers."³ In 1625 van Helmont's opponents succeeded in getting from the examiners of the Holy Inquisition of Spain a condemnation of a number of pro-

¹ Corneille Broeckx has gone into the matter of van Helmont's persecution very thoroughly, and his "Notice sur le Manuscrit Causa J. B. Helmontii déposée aux Archives Archiépiscolales de Malines," *Annales de l'Académie d'Archéologie de Belgique*, tome ix (Antwerp, 1852), pp. 341-67, and *Interrogatoires du Docteur J. B. van Helmont sur le Magnétisme Animal* (Antwerp, 1856), contain all the relevant facts that are known.

² According to the *Nouvelle Biographie Générale depuis les temps les plus reculés* (Paris, 1858), tome xxiii. We have been unable to verify the editions of *De Magnetica vulnerum* published during van Helmont's lifetime. The British Museum has a copy of a posthumous edition (published 1662) only.

³ *Oriatrike*, Preface by F. M. van Helmont.

positions contained in his book as heretical and appertaining to magic. In the autumn of 1627 van Helmont was interrogated by Leroy, the official of Malines, and his secretary, concerning the presumably heretical propositions. He replied that he had submitted the book to the ecclesiastical authorities and would abide by the decision of the Church concerning it. At a later interrogation, in 1630, he declared himself willing to burn the offending book if the tribunal judged this to be necessary.

During the whole of this time his enemies were incessant in their efforts. The entire forces of traditionalism and bigotry were united to encompass his destruction. The medical and theological faculties of most of the leading continental universities were unanimous in their condemnation, and their verdict was published at Leyden, in 1634, in a work directed against him.¹ A further edition of the offending treatise also appeared in this year at Liège,² and the same year witnessed the triumph of his enemies. Their victim was arrested. His books and charts were confiscated, and he was imprisoned in the Convent of the Friars Minor, or Franciscans, of Brussels. He did not, however, remain there more than two weeks, since a request that he should be allowed to serve his imprisonment at

¹ *Joannis Baptistæ Helmontii medici et philosophi per ignem propositiones notatu dignæ, depromptæ ex ejus disputatione de magnetica vulnerum curatione Parisiis edita. Additæ sunt censuræ celeberrimorum tota Europa theologorum et medicorum ex autographis optima fide descriptæ.*

² According to Rommelaere, *op. cit.* See footnote 2, p. 33.

home, backed up by an exceedingly large bail offered by his father-in-law, was finally granted. His position became, as Ferguson remarks, "something resembling a ticket-of-leave man under police supervision."¹

Van Helmont's cup of misfortune was not yet, however, full. During the period of his imprisonment, an epidemic of the plague broke out. He was, apparently, allowed to attend certain of the sick during this period, and rescued many. Amongst others to be afflicted were the two elder of his three sons, who might have escaped, had they been willing to go into the country and forsake their father. These were removed to the hospital at Vilvorde in charge of the nuns. The nuns attending them promised to administer van Helmont's remedies, but, after they had received the two patients, they refused to give any other than the orthodox Galenical ones, with the result that both died.

The conditions of van Helmont's imprisonment appear to have been relaxed after some years, and it seems that he regained his liberty before he died, though the whole matter is wrapped in obscurity; and it was not until two years after his death that he was completely cleared of the charge of heresy. In 1642 he published, at Antwerp, his work on Fevers, *Februm doctrina inaudita*, which was followed by a further edition, published at Cologne, in 1644, containing

¹ John Ferguson: *A Catalogue of the Alchemical, Chemical and Pharmaceutical Books in the Collection of the late James Young of Kelly and Durris, Esq.* (Glasgow, 1906), vol. i, p. 381.

in addition three other monographs, dealing respectively with the Disease of the Stone, the Plague, and the Errors of the Galenists, the general title of the book being *Opuscula Medica inaudita*.

In the intervening year (1643), an accident happened to van Helmont which nearly cost him his life. Writing in a closed room, in which, on account of the cold, he had caused a pan of burning coals to be placed, he was overcome by the fumes (carbon monoxide). Fortunately his young daughter, with a sound instinct, removed the brazier in time. He recovered and was able to use this experience to illustrate one of his medical theories.¹

Towards the end of 1644 he contracted pleurisy ; and, weakened by his labours and by the treatment which had been meted out to him, he succumbed.² He was hated by those (and they were not few) whose errors and follies his sharp intellect had pierced. Not only, however, was he loved by his family, but he had earned the devotion and gratitude of the immense number of men and women he had rescued from disease and death. By his work he had raised the edifice of science a stage higher than that in which he found it, he had rebuilt and strengthened some of its foundations, and thereby earned for himself an imperishable name in the history of thought.

¹ "The Authority or Privilege of the Duumvirate," § 20, *Oriatrike*, p. 300, and "Of the Disease of the Stone," ch. ix, § 54, *ibid.*, pp. 909 and 910.

² *Oriatrike*, Preface by F. M. van Helmont.

CHAPTER IV

MYSTICISM AND MAGIC

(a) EPISTEMOLOGY

CONCERNING mysticism the late C. C. Massey wrote as follows :

“Mysticism is a peculiar vital apprehension of spiritual principles and energies, and of their functional operations in or through man and nature. It claims a certitude analogous to that of sensible experience, and usually designated ‘intuitional.’ Thought, in whatever province it is exercised, seeks to recover for consciousness the synthesis of its related elements ; ‘intuition’ gives this synthesis immediately, and is a direct perception of truth in an organic and concrete unity.”¹

The point is well brought out in the works of van Helmont. A keen opponent of the futilities of scholastic philosophy, he opens his criticism of it by an attack on reason. The word is, of course, employed by him, not with the wide

¹ *Thoughts of a Modern Mystic : a Selection from the Writings of the late C. C. Massey*, edited by Professor W. F. Barrett, F.R.S. (London, 1909), p. 136. Cf. H. S. Redgrove : “The Nature of Intuition,” *The Magic of Experience*, (London, 1915), § 28, pp. 56 and 57.

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denotation of modern usage, but as signifying the dianoetic reason, *i.e.* the discursive or ratiocinative faculties, in contradistinction to the noetic. Not by mere argument or the demonstrations of deductive logic is a true understanding of things to be attained. He writes :

“ The knowledge which we have by demonstration, was already before in us, and onely is made a little more distinct by a Syllogisme : but yet it remains as before, joyned with doubting : Because every conclusion doth necessarily follow the weaker part of the premises : hence it comes to passe, that it is composed with a doubt of the contrary.” ¹

And again :

“ The understanding is alway perfected, by suffering and receiving. But the imaginative knowledge or animal understanding, which was known to *Aristotle*, beholdeth things onely on the outside, and frameth to it self Images or likenesses thereof, according to its own thinking ; and with all wearisomness of labours, runs about them into a circle.” ²

Real knowledge must, in its very nature, involve intuition ; for it to be possible the knower and the thing known must, in some way, become identified :

¹ “ Logick is unprofitable,” § 13, *Oriatrike*, p. 39.

² “ The hunting, or searching out of Sciences,” § 61, *Oriatrike*, p. 26.

“The very understandingness of a thing, is nothing but a coming to, and immediate approach of the unity of the understanding, and of the thing understood.”¹

It is recorded that on the portico of the ancient temple of Delphi was engraven the command, “Man, know thyself.” If man could but completely know himself he would know all things: van Helmont thus gives expression to this great mystic truth:

“Our Soul understanding it self, doth after a sort, understand all other things, because all other things, are in an intellectual manner in the Soul, as in the Image of God. Wherefore indeed, the understanding of our selves, is most exceeding difficult, ultimate or remote, excellent, profitable, beyond other things.”²

How then is this knowledge to be attained?

Van Helmont indicates two necessary requisites. Not less than any modern scientific philosopher does he insist upon the need of experiment. Indeed, his whole life affords a demonstration of his devotion to scientific research. True knowledge of natural phenomena is to be gained, he indicates, “not indeed by a naked description of discourse, but by handicraft demonstration of the fire.”³

¹ “The hunting, or searching out of Sciences,” § 55, *Oriatrike*, p. 25.

² *Ibid.*, § 56, *Oriatrike*, p. 25.

³ “The ignorant Natural Philosophy of Aristotle and Galen,” § 10, *Oriatrike*, p. 45.

But something still more is necessary. No philosopher, denying the reality of the spiritual, has been able to explain how it is possible for the mind to pass from the particular to the general, that is, from particular instances gained by experience, to induce a natural law or general theory. There is something magical in it. It partakes—as van Helmont indicates—of the nature of revelation. He writes :

“ But if a happy Soul shall sometimes conceive of God in it self, by the beatifical Vision, then by the same beam of light, he shall behold and know God himself, and all other things inwardly.”¹

In reading van Helmont's account of his early studies, already quoted in Chapter II, one cannot but be impressed by the importance he attached to his dream-experience. In this attitude he persisted throughout his life. In one place in his works we read as follows :

“ In sleep, the whole knowledge of the Apple [*i.e.*, that which obscures the magical powers of pristine man] doth sometimes sleep : Hence also it is, that our dreams are sometimes Prophetical, and God himself is therefore the nearer unto Man in Dreams, through that effect.”²

We may, perhaps, be inclined to criticise van

¹ “ The hunting, or searching out of Sciences,” § 57, *Oriatrike*, p. 25.

² “ Of the Magnetick or Attractive Curing of Wounds,” § 98, *Oriatrike*, p. 781.

Helmont for the faith he put in dreams ; but we must remember that it is especially in dreams that the products of unconscious thought—the importance of which modern psychology demonstrates—become manifest ; though it would, indeed, seem to require some special degree of intellectual acumen—of mystic insight, shall we say ?—for consciousness to separate, from the dross, that which is of value in what remains for it of such products. We should certainly hesitate to recommend anyone to follow van Helmont in the reliance he placed in his dreams. But they do not appear to have led him astray. It was a dream which caused him finally to devote his life to medicine, and it was another dream that prevented him from following a resolve made in a moment of depression to destroy his medical writings.

(b) ONTOLOGY

Van Helmont's deeply religious attitude of mind is evident in every one of his writings. His epistemology looks to God as the source of all knowledge, his ontology finds in God the source of all being. For him, Nature is "*the Command of God, whereby a thing is that which it is, and doth that which it is commanded to do or act.*"¹ Elsewhere he writes : "Created things do alwayes respect the will of their Creator, which man alone neglecteth."²

Aristotle's theory of causation he entirely

¹ "The ignorant Natural Philosophy of Aristotle and Galen," § 3, *Oriatrike*, p. 42.

² "The Gas of the Water," § 41, *Oriatrike*, p. 77.

rejected. After God, there are, according to him, strictly speaking, only two causes of things, the material, or cause *ex qua*, and the efficient, or cause *per quam*. The ends (or forms) reside in the latter and have no existence apart from it. The material cause—as we shall see more fully in the following chapter—he considered to be *water*. The efficient cause is a quasi-spiritual principle, the “archeus” or “master workman,” whose activity is manifested as a “fermentation”; this activity is excited and its quality determined by certain “ferments” present in the matter operated upon. Van Helmont was essentially a chemist; he sought to found his philosophy on chemical facts and theories as known to him, rather than on logic as Aristotle had done, and, impressed with the phenomena of the alcoholic fermentation of grape juice and malt, he thought he saw therein a clue to the deepest mysteries of Nature’s activities.

It must be confessed, however, that, as concerns the problem of causation, he was more successful as a critic of scholasticism than as a constructive thinker. His own theory is at once obscure and fantastic. The following epitome of it, quoted from Thomson’s *History of Chemistry*, is perhaps as clear an account as can be hoped for :

“According to Van Helmont, a particular disposition of matter, or a particular mixture of that matter is not necessary for the formation of a body. The archeus, by its sole power,

draws all bodies from water, when the *ferment* exists. This *ferment*, in its quality of a mean which determines the action of the archeus, is not a formal being; it can neither be called a *substance*, nor an *accident*. It pre-exists in the seed which is developed by it, and which contains in itself a second ferment of the seed, the product of the first. The ferment exhales an odour, which attracts the generating spirit of the archeus. This spirit consists in an *aura vitalis*, and it creates the bodies of nature in its own image, after its own *idea*. It is the true foundation of life, and of all the functions of organised bodies; it disappears only at the instant of death to produce a new creation of the body, which enters then, for the second time, into fermentation.”¹

(c) PSYCHOLOGY

Turning now to van Helmont's psychological doctrines, we notice in the first place that, contrary to current opinion, he regarded the stomach, and especially its upper mouth, as the seat of the sensitive soul, from whence, by means of the archeus, the soul's influence was diffused throughout the body, as the rays of light are brought from the sun to the earth.² In the chapters of his works devoted to this subject, several reasons are given for this view, reference being made to phenomena which can be recog-

¹ Thomas Thomson: *The History of Chemistry* (The National Library, No. III, London, 1830), pp. 183 and 184.

² “A Mad or Foolish Idea,” and “The Seat of the Soul,” *Oriatrike*, pp. 272-88.

nised in some cases as due to the sympathetic nervous system. Very interesting is an account of a remarkable experience he had as the result of swallowing a small quantity of monkshood,¹ in the course of an investigation of the effects of poisons. Soon after taking the drug he most clearly felt his powers of understanding and thought to be concentrated in his stomach. The feeling passed in the course of a couple of hours. Attempts to reinduce it by repeating doses of the drug proved unsuccessful.

The brain, according to him, is "the executive member of the conceipts of the soul, as it sits chief over the sinews and muscles, in respect of motion; but in respect of sense or feeling, it possesseth in it self, the faculties of memory, will, and Imagination": whilst the "minde sitteth in the sensitive soul, whereto it was consequently bound after the fall."² Madness, he regarded as a disease, not of the mind, but of the sensitive soul; it only appears to affect the mind because this is bound to the soul. The mind is immortal, and is "the nearest image of the Divinity."³

¹ "A Mad or Foolish Idea," § 12, *Oriatrike*, p. 274. Thomson (*op. cit.*, p. 186) says the herb was "*aconitum* (*henbane*)," which is an error, since *aconitum* is not henbane (*Hyoscyamus niger*, L.). Van Helmont writes *Napellus*, that is, monkshood, wolfsbane or aconite (*Aconitum Napellus*, L.). The plant was well known to the ancients as a poison. Its physiological effects are due to three alkaloids, aconine, aconitine, and benzaconine.

² "The Seat of the Soul," § 32, *Oriatrike*, p. 288.

³ "The compleating or perfecting of the minde," § 13, *Oriatrike*, p. 312.

Van Helmont, like Paracelsus, was rather fond of coining new words to express his ideas, though he took care to explain what he meant by them. One of these words is "blas," by which is signified the power of activity peculiar to each thing, impressed on it by the Creator. Thus "a naturall Winde, is a flowing Air, moved by the Blas of the Stars."¹ To this *blas* of the stars he attributed the changes in the seasons and other meteorological phenomena, but the doctrines of astrology he repudiated. Heredity, rather than astral influence, he regarded as supplying the explanation of the manifold diversities of human character, no less than that of brute beasts. The stars, for him, are indeed, as the Scripture says, for "Signs, Times or Seasons, dayes and years"; but they are destitute of influence upon man, the source of whose inclinations, rather, is to be found in the seed wherefrom he has sprung. Man possesses free will. In him there is a "twofold Blas: To wit, One which existeth by a natural motion; but the other is voluntary, which existeth as a mover to it self by an internal willing."² To this "internal blas" or will, van Helmont attributed very potent powers, in which respect he seems to be in agreement with modern thought. Indeed, we are only just beginning to realise how potent these powers are, and further research may open up to us possibilities hardly realised at the present moment. In this connection it

¹ "A Vacuum or emptiness of Nature," § 1, *Oriatrike*, p. 81.

² "The Blas of Man," § 9, *Oriatrike*, p. 177.

will be of interest to deal with van Helmont's work on the Magnetic Curing of Wounds, in which the matter is treated in some detail.

(d) THE POWER OF MAGNETISM

In common with many of his contemporaries, van Helmont was much impressed by the remarkable properties of the lodestone, and he grouped along with such phenomena, under the general name of "magnetism," such other cases as were known to him of (apparent) action at a distance, as, for example, the attraction of rubbed amber for pieces of chaff, etc., the heliotropism of plants and the phenomenon of consonance as exhibited by a couple of violin strings, together with a number of instances of sympathetic magic which were well accredited in his day, but in which it may seem surprising that a man of so great acumen as himself should have believed. Of these, the belief in the cure of wounds by Paracelsus's sympathetic ointment,¹ which was applied not to the wound itself, but to the bloody weapon wherewith it had been inflicted, may serve as a typical sample. Van Helmont strove, in his work on the Magnetic Curing of Wounds, to show the rationale of this marvel; and one can only reflect on the difficulty which even the greatest minds experience in freeing themselves from the errors of their age.

When he writes concerning the magnetism of

¹ See H. S. Redgrove: "The Powder of Sympathy: a curious Medical Superstition," *Bygone Beliefs* (London, 1920), for full details as to this.

n, however, his work is on a higher level. He points out that, if man be truly made in the image of God, then like God he ought to be able to act, do some things at any rate, by a mere effort of his will, that is to say, by his word alone. This power, he says, lies in the hidden man, obscure, as it were asleep, in his present corrupted state. Its activity is, for this reason, restricted to operating within a man's own body, but the possibility remains (and is not doubted by van Helmont) of its becoming fully awakened and operative on external objects.¹

This power, van Helmont calls "magical," warning his readers not to be afraid of the name. Doubtless, he says, it is this power which the Devil uses for his own ends in the case of witches and their like. But the power is certainly not evil in itself. It is indeed God-given, and, if it may be awakened for evil purposes, no less may it be awakened for good. He suggests that in the mysteries of the *Kabalah* one method for achieving this is contained. He writes as follows :

"There doth inhabit in the Soul, a certain magical Virtue, given her of God, naturally proper and belonging unto her, inasmuch as we see his Image and Engravment; that in this respect also, she acts after a peculiar manner, that is, spiritually on an Object at a distance, and that much more powerfully, than by any

¹ "Of the Magnetick or Attractive Curing of Wounds," pp. 90-97, *Oriatrike*, pp. 780 and 781.

corporeal helps ; because, seeing the Soul is the more principal part of the Body ; therefore the Action belonging unto her, is spiritual, magical, and of the greatest Validity : That the Soul doth by the same Virtue which was rendred as it were drowsie through the knowledge gotten by eating of the Apple, govern and stir her own Body : but that the same magical Faculty being somewhat awakened, is able to act also out of her Prison, on another distant Object, only by her Beck, conveyed thereunto by Mediums : for therein indeed is placed the whole Foundation of natural Magick ; but in no wise, in Blessings, Ceremonies, and vain Superstitions ; but that all these wicked observances were brought in by him, whose endeavour it hath alwayes been, every where to defile all good things with his Tares.

“ But we do not tremble at the name of Magick, but with the Scripture, interpret it in a good sense :

“ Yet we have granted that it may be indifferently employed to a good or evil Intent, to wit, by the use or abuse of that Power.

“ And so that, under that Word we understand the most profound inbred knowledge of things, and the most potent Power for acting, being alike natural to us with *Adam*, not extinguished by Sin, not obliterated, but as it were become drowsie, therefore wanting an Excitement.

“ Therefore we shew, that Magnetism is exercised, not indeed by Satan ; but by that which belongs not to Satan ; and therefore that

this Power which is co-natural unto us, hath stood abusively dedicated to Satan, as if he were the Patron thereof: that the Magical Power doth as it were sleep in us since Sin, and therefore that it hath need of a stirrer up.

“Whether that Exciter be the holy Spirit by Illumination, as the Church mentions to have happened in the Eastern Magi or Wise Men of the East, and which at this day sometimes happens in others: or Satan doth also for some foregoing submissive Engagement, stir up the same in Witches: And in such as these, the Excitation is as it were by a waking sleepiness, by a Catochus, and therefore is imperfect in regard of the manner, Evil in regard of the end, Obscure in regard of the Meanes, and Wicked in regard of the Author: Nor doth the Turn-coat-impostor suffer that the Witch should know this Power to be natural unto her self, whereby he may hold her the more fast bound to himself, or least the exercise of so noble a Power being stirred up, should incline otherwise than to Wickedness, therefore he commands the Rains himself; neither hath the Witch known how to stir it up at her own pleasure, who hath wholly prostrated her self to the Will of another Tyrant.

“Also Man himself is able through the Art of the Cabal, to cause an excitement in himself, of so great a Power at his own Pleasure, and these are called Adeptists; or Obtainers, whose Governour also, is the Spirit of God.”¹

¹ “Of the Magnetick or Attractive Curing of Wounds,” §§ 121-7, *Oriatrike*, p. 784.

These ideas, we think, are of much interest in view of the results of modern experimental research in the domain of abnormal psychology, especially as concerns the phenomena of telepathy, hypnotism, telekinensis, and the voluntary production of phantasms of the living.

Van Helmont goes even further in his estimate of the potency of man's magical power, and suggests that something of this power resides in the more outward man, so that his flesh and blood possess a magical efficacy; on which grounds he attempts to justify the fantastic ingredients in Paracelsus's sympathetic ointment, which include mummy, the moss found upon the skull of a dead man and the fat of a boar and a bear. Thus does van Helmont seem, as it were, to oscillate from the sublime to the ridiculous. In which of these categories, it may be asked, ought we to put his assertion that "Nature is on every side a Magitianess, and acts by her own Phantasie" ?¹ Almost identically the same words appear in the *Occult Philosophy* of Cornelius Agrippa, and Novalis in more recent years voiced the opinion of both of these old occult philosophers, when he declared that "All experience is magic and only magically explicable," thereby returning, perhaps, the only answer that is ultimately possible to the eternal Why ? of things.

Joseph Ennemoser devotes several pages of his *History of Magic* to quotations from van

¹ "Of the Magnetick or Attractive Curing of Wounds," § 156, *Oriatrike*, p. 789 (wrongly numbered 779).

Helmont's work on the Magnetic Curing of Wounds and other writings, adding that they are so clear in themselves as not to need comment. He refers to an essay dealing with van Helmont's views concerning "animal magnetism" by Deleuze, in which the latter intimates that, whilst he has found many illusory ideas, superstitious notions and incomprehensible things in the writings of van Helmont, he has also found in them many great truths. With this judgment, all who take the care seriously to study van Helmont's works will, we think, agree.

CHAPTER V

ALCHEMICAL ACHIEVEMENTS

(a) RESEARCHES ON GASES

WE have already quoted the very high opinion of van Helmont as a chemist expressed by Professor E. von Meyer. Thomson, who, in his *History of Chemistry*, deals with van Helmont at considerable length, indicates "how far his chemical knowledge was superior to that of the age in which he lived."¹ James Campbell Brown writes of him as "a great chemist, undoubtedly the greatest prior to Lavoisier."² And much similar testimony to van Helmont's ability as a chemical investigator could be quoted from the works of other authorities.

The first of van Helmont's achievements in chemistry that calls for attention is his discovery of the gas now known as carbon dioxide, carbonic anhydride, or carbonic acid gas. His observations concerning this substance were, strangely enough, almost entirely neglected by succeeding chemists, until Joseph Black, in the middle of the eighteenth century, rediscovered the gas, naming it "fixed air." Black has sometimes been

¹ *Op. cit.*, p. 186.

² James Campbell Brown: *A History of Chemistry from the Earliest Times to the Present Day* (London, 1913), p. 202.

erroneously awarded the honour of the discovery, though he himself refers—not very graciously—to the previous observations of van Helmont. It is to van Helmont, indeed, that we owe the very word *gas* itself; natural philosophers previous to him, and some that came after, regarded all gaseous substances as being mere varieties of air. Van Helmont distinguishes between a vapour, which could be condensed, and a gas, which could not; and the distinction has proved a useful one, though it is now known not to be valid. In choosing the designation “gas” he tells us that he had “the Chaos of the Auntients”¹ in mind. “Gas,” he writes, “is a far more subtile or fine thing than a vapour, mist, or distilled Oylinesses, although as yet, it be many times thicker than Air”²; and again, “I call this Spirit, unknown hitherto, by the new name of Gas, which can neither be constrained by Vessels, nor reduced into a visible body, unless the seed being first extinguished.”³

The origin of the word “gas” is of interest, and the fact that the concept “spirit” antedated that of “gas” by thousands of years is significant, because judging by the remarks of some of the more extreme opponents of philosophic spiritualism, it might be gathered that the idea of “spirit” is nothing more than an unjustifiable extension of that of “gas.” In point

¹ “The Essay of a Meteor,” § 28, *Oriatrike*, p. 69.

² *Ibid.*, § 29.

³ “The Fiction of Elementary Complexions and Mixtures,” § 14, *Oriatrike*, p. 106.

of fact, we see that the relation between the two ideas is almost the opposite of this. In the thought of the old alchemical philosophers, the distinction between matter and spirit was not drawn so sharply as has been the case since the days of Descartes, and their view of the genesis of inorganic bodies was essentially vitalistic. "All Beings," writes van Helmont, "do after some sort partake of life,"¹ confirming his views by quoting from the Scriptures the passage: "Come let us worship the King by whom all things live." Many other of the concepts, it may be noted, upon which materialistic philosophy much prides itself, can be shown to have their roots in animism.

Van Helmont called carbon dioxide gas, *gas sylvestre*, or the wild gas, on account of its apparent incondensability. He observed that it is produced when acetic acid acts on calcium carbonate (*i.e.* when distilled vinegar acts on crab stones), by the combustion of wood, coal and tallow and in the production by fermentation of wine and beer.² He noticed its occurrence in mineral waters, and in the stomach, and was aware of its presence in the *Grotto del Cane* near Naples. He observed that the gas extinguished the burning of a candle; but he was sadly handicapped in his study of gases by the lack of suitable apparatus for the collection of such bodies;

¹ "The Gas of the Water," § 37, *Oriatrike*, p. 75.

² "The Fiction of Elementary Complexions and Mixtures," § 14, *Oriatrike*, p. 106, "Of Flatus's or Windie Blasts in the Body," §§ 67 and 68; *ibid.*, pp. 426 and 427, and elsewhere.

and in consequence failed to distinguish between this gas and others which he obtained. Of gases which, like carbon dioxide, are non-supporters of combustion and themselves incombustible, he appears to have made sulphur dioxide (formed when sulphur burns in air), nitrous oxide (laughing gas), nitrogen peroxide (a red gas, obtained by the dissolution, in the presence of air, of many metals in strong nitric acid or *aqua fortis*) and probably others. In addition to recording the occurrence of *gas sylvestre* in the human stomach, his works make mention of an inflammable gas as sometimes being voided by the large intestine.

A further hindrance to the real progress of his studies was the notion, which he firmly held, and to which we shall refer again, that water was the first matter of all material things. This idea, entering into his description of the nature of gas, makes it confused, since gas had somehow to be explained as being formed of water.

In "A Vacuum, or emptiness of Nature," van Helmont described an interesting experiment, which nowadays figures in every elementary textbook of practical chemistry, with a burning candle which is placed in a trough partly filled with water and covered with a jar.¹ He realised that, in this experiment, gas was formed, and observed that the bulk of the air decreased, but failed to draw correct conclusions from his experiment, because he was not aware (i) that this gas was soluble in water, and (ii) that air played a part in its formation. He was, however, the first

¹ *Oriatrike*, pp. 82 *et seq.*

rightly to explain the explosive force of gunpowder as due to the production of gas.¹

(b) RESEARCHES ON CONSERVATION

Van Helmont enriched the science of chemistry by many other valuable observations and experiments, besides those dealing with gases. Especially to his credit and indicative of his originality are some in which he seems to have come within an ace of realising, not only the true nature of a chemical element as later it was defined by Boyle, but also the law of its persistence, which it remained for Lavoisier clearly to formulate in the early part of the nineteenth century. He clearly realised, in certain instances at any rate, that metals, for example, continue to exist throughout a series of chemical metamorphoses. This was rather a novel notion in his day. It was, for example, commonly believed by the alchemists that when iron was immersed in a solution of blue vitriol it was transmuted into copper. In van Helmont's work on the Waters of the Spa, this idea is controverted; and he contributed more than any one else to its demolition, and the substitution for it of the more rational notion that the copper which is deposited on the iron was formerly present in the solution. In this work he also pointed out that silver is not destroyed when dissolved in nitric acid (*aqua fortis*), that it is present in the resulting liquid and can be reobtained therefrom, in its

¹ "The Fiction of Elementary Complexions and Mixtures," §§ 22-24, *Oriatrike*, p. 107.

original form, by means of copper.¹ Moreover, he studied the quantitative side of chemical reactions as well as the qualitative—a fact which is especially to his credit, seeing how little attention was paid to the balance in his day, and yet how much the science of chemistry owes to its use. One of his most remarkable and valuable pieces of work was the discovery that from a given weight of glass, the exact weight of sand (silica) can be obtained as was used in the preparation of it.²

(c) THE FIRST MATTER

The conclusion that van Helmont drew from this last-mentioned experiment may, however, seem rather surprising and, perhaps, disappointing to the modern man of science, whose views, unlike those of this seventeenth century thinker, are mechanistic rather than vitalistic, and who regards *combination*, rather than *development*, as the essential factor in the evolution of the complex from the simple. In silica, van Helmont thought he had discovered elementary earth. He named it “*quellem*,” and the fact that the same weight of *quellem* could be obtained from one of its

¹ “A Third Paradox,” § 16, *Oriatrike*, p. 695. Cf. “A Modern Pharmacopoleon and Dispensatory,” § 55, *ibid.*, p. 467.

² The method is to fuse the glass with an alkali and then to precipitate the silica by means of an acid. See “The Earth,” *Oriatrike*, pp. 50 to 52, and “The Power of Medicines,” § 37, *ibid.*, p. 478. Cf. “A Treatise of Fevers,” ch. xv, § 20; *ibid.*, p. 1001, where a quantitative experiment on mercury is described.

compounds as was used in preparing this, led him to deny to *quellem*, or earth, any power or potency in the generation of things. "The sand, or the Element of the earth," we read in his works, "doth never concur to natural and seminal generations."¹ Fire he very rightly denied to be an element or anything material at all.² His treatment of air, as we have already suggested, is, on the other hand, neither clear nor satisfactory. He regarded air as being an element; but for no very good reason, it was excluded from his theory of the genesis of material bodies, and was denied to possess any weight. Water, as we have already said, he regarded as being the "first matter," or material cause, of all things. In substantiation of this theory, he described many experiments he carried out, one of which is of much interest. His account of it is as follows:

"I took an Earthen Vessel, in which I put 200 pounds of Earth that had been dried in a Furnace, which I moystened with Rain-water, and I implanted therein the Trunk or Stem of a Willow Tree, weighing five pounds; and at length, five years being finished, the Tree sprung from thence, did weigh 169 pounds, and about three ounces: But I moystened the Earthen Vessel with Rain-water, or distilled water (alwayes when there was need) and it was large,

¹ "The Earth," § 14, *Oriatrike*, p. 52.

² "The Elements," § 8, *Oriatrike*, p. 48, and "The Earth," § 1, *ibid.*, p. 50.

and implanted into the Earth, and least the dust that flew about should be co-mingled with the Earth, I covered the lip or mouth of the Vessel, with a Iron-Plate covered with Tin, and easily passable with many holes. I computed not the weight of the leaves that fell off in the four Autumnes. At length, I again dried the Earth of the Vessel, and there were found the same 200 pounds, wanting about two ounces. Therefore 164 pounds of Wood, Barks, and Roots, arose out of water onely.”¹

It is curious that he should have neglected to consider the possibility of a proportion of the increased weight being due to material derived from the air.

(d) THE TRANSMUTATION OF METALS

The final achievement in chemistry, if such it may be called, with which van Helmont, it seems, must be credited, is of a most surprising nature. He claims that he accomplished the transmutation of base metal into gold, though unacquainted with the composition of the agent he used to effect this marvel, which was given to him by a stranger. Let the account of this extraordinary occurrence be related in his own words :

“I am constrained,” he writes, “to believe that there is the Stone which makes Gold, and which makes Silver ; because I have at distinct

¹ “The Fiction of Elementary Complexions and Mixtures,” § 30, *Oriatrike*, p. 109.

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turns, made projection with my hand, of one grain of the Powder, upon some thousand grains of hot Quick-silver ; and the buisness succeeded in the Fire, even as Books do promise ; a Circle of many People standing by, together with a tickling Admiration of us all. . . . He who first gave me the Gold-making Powder, had likewise also, at least as much of it, as might be sufficient for changing two hundred thousand Pounds of Gold : . . . For he gave me perhaps half a grain of that Powder, and nine ounces and three quarters of Quick-silver were thereby transchanged : But that Gold, a strange Man, being a Friend of one evenings acquaintance, gave me.”¹

In two other places in his works he refers to alchemical transmutation as illustrative of the manner of “the Regeneration of those that are to be saved, and of the participation of Life in the Communion of the Eucharist,” and tells how he accomplished it :

“For I have divers times handled that stone [which makes gold] with my hands, and have seen a real transmutation of saleable Argen-tive or Quicksilver with my eyes, which in proportion did exceed the powder which made the gold in some thousand degrees.

“Indeed it was of the colour, such as is in Saffron, being weighty in its powder, and shining like bruised Glass. . . . But there was once given unto me, the fourth part of one grain. I call also a grain the six hundredth part of an ounce.

¹ “The Tree of Life,” *Oriatrike*, p. 807.

“ This powder therefore I involved in Wax, . . . least in casting it into the Crucible, it should be dispersed through the smoakinesses of the coals: which pellet of wax, I afterwards cast into the three-corner'd Vessel of a Crucible, upon a pound of Quicksilver, hot, and newly bought; and presently, the whole Quicksilver with some little noise, stood still from flowing, and resided like a Lump: But the heat of the Argent-vive, was as much as might forbid melted lead from re-coagulating: The Fire being straightway after increased under the Bellows, the Mettal was melted, the which the Vessel of fusion being broken, I found to weigh eight ounces of the most pure gold.

“ Therefore a computation being made, a grain of that powder doth convert nineteen thousand two hundred grains of impure and volatile Mettal, which is obliterated by the fire, into true gold.

“ For that powder, by uniting with the aforesaid Quicksilver unto it self, preserved the same at one instant, from an eternal rust, putrefaction, death, and torture of the fire, howsoever most violent it was, and made it as an Immortal thing, against any vigour and industry of Art and Fire, and transchanged it into the Virgin purity of Gold.”¹

We have here the testimony to the reality of alchemical transmutation of a man who was no

¹ “ The Position is Demonstrated,” § 58, *Oriatrike*, p. 674. Cf. “ Life Eternal,” *Oriatrike*, pp. 751 and 752, where the account is repeated in almost the same words and with the same religious motive.

impostor claiming to have discovered the great secret of the Philosopher's Stone and desirous of gaining credit for his claims, but one whose whole life was animated by philanthropic motives, and whose good faith is above question. His knowledge of chemical phenomena was, no doubt, very defective judged by the light of modern science, and his theories contain much that is fantastic; but we must, at least, regard him as having been a sufficiently good chemist to have been able to distinguish real gold from a spurious imitation of it. In any case, however, modern science is acquainted with no reagent which, in the proportions stated, would convert mercury into any substance resembling gold in the least.

There is nothing more extraordinary in the works of van Helmont, or in the whole literature of alchemy, than the words we have quoted—though there are one or two passages in other writers which parallel them. Modern scientific research has demonstrated the fact of the evolution of the elements of the inorganic world, and thus indicates the possibility of transmutation. Not only, however, is the method of achieving this unknown, but nothing even approximating to van Helmont's transmutations is indicated as remotely possible. Dare we draw the conclusion that there are phenomena unknown to modern science with which the old-time alchemists were acquainted—forces unknown to-day which they manipulated?

The elusive alchemical adept who wrote under the name of Eirenæus Philalethes had a high

opinion of van Helmont ; and with a quotation from his works relative to the subject of our study and a few remarks arising therefrom this chapter may well close. "Eirenæus Philalethes," after stating that of none of van Helmont's experiments is he ignorant, wrote :

"What I most honour in that noble Naturalist is, that he did search out the *Occulta Naturæ*, more accurately than ever any did in the World. So that (setting aside the skill of this Mastery [namely, that of the preparation of the Philosopher's Stone], of which I cannot find any foot-steps in what of his is extant) I am confident he was without flattery Nature's Privy-Counsellor, and for Philosophical verity might have commanded this Secret ; but God doth not reveal all to all men, yet who knows what he may live to be Master of in this point too.

"This I speak not to flatter him, who (besides what is evident to the whole World in his Writings) have no other character of him, and to him I am like to remain a perpetual Stranger ; yet could as heartily desire his acquaintance, as any man's I know in the World, and if the Fates prevent not mine intentions, by mine or his death, I shall endeavour familiarity with him."¹

When these words saw the light of publication, the subject of them was already dead, but it is pleasing to speculate, if we may be allowed to

¹ "Eirenæus Philalethes" : *Ripley Reviv'd* (London, 1677), pp. 279 and 280.

assume, not only "Eirenæus Philalethes's" adeptship, but his attainment of it at a very early age,¹ that in the meantime he may have met van Helmont and have been the stranger responsible for the gift of the philosophic Stone. There is no evidence, however, and the whole question of the stranger's identity is shrouded in seemingly impenetrable darkness.

¹ He appears to have been born in 1623. For further details concerning this extraordinary personage see H. S. Redgrove's *Alchemy: Ancient and Modern*, § 60, and the authorities there referred to.

CHAPTER VI

THE ADVANCEMENT OF THE HEALING ART

(a) PHYSIOLOGY

FOR van Helmont, all other sciences were subservient to that science or art (whichever one prefers to call it: it is, indeed, both) which has for its end the healing of the manifold diseases to which mankind is heir, and the prolongation of human life. To cure disease necessitates an understanding of the nature of disease, and in order to understand the nature of disease, a knowledge is essential of the structure of the human body and the functions of its parts. During the early part of the seventeenth century there was a considerable awakening of interest in physiological and anatomical investigation, many important researches being undertaken and many important discoveries being thereby made. On the whole, van Helmont does not seem to have profited as much as one might have expected by the work in physiology of the more progressive of his contemporaries. Harvey's book announcing the discovery of the circulation of the blood, for example, was published in 1628, but either van Helmont did not read it, or, alternatively, did not accept its conclusions. With the Galenists he still thought that blood (of different degrees of purity) was conveyed from the heart to the various organs by both arteries

and veins; he did not realise the true nature of the function of respiration, though he rightly rejected the current view which supposed the function of the inspired air to be chiefly that of cooling the extreme heat of the heart; and, with his orthodox brethren, he believed, in spite of its evident impossibility, in the passage of blood through the septum from the right to the left ventricle of the heart, going so far, indeed, as to invent a mechanism to explain why the blood could only pass through the septum in this direction whereas the hypothetical vital spirits could also pass contrariwise. On the other hand, van Helmont's contribution to physiology was of no little importance. It is true, perhaps, that the iatrochemists tended to over-emphasise the purely chemical aspect of the functions of living organisms, but it was certainly better that this aspect should be over-emphasised than that it should be neglected. Moreover, whilst Paracelsus postulated hypothetical chemical principles—his salt, sulphur and mercury—in the human body, van Helmont sought, by such means as were at his disposal, to identify the actual chemical nature of the various juices.

In the chapter on "Mysticism and Magic" his physiological views have already been touched upon, and the doctrine of archei, which he adopted from Paracelsus, has been briefly described. According to van Helmont, the whole of the economy of the human body is controlled by a hierarchy of these quasi-spiritual principles, chief of them all being the archeus of the stomach.

The stomach he regarded as the most important organ of the body, or rather the stomach and spleen taken together, for it was in the spleen that van Helmont thought that the digestive juice of the stomach was formed. The stomach, according to him, cannot act without the spleen, and to these two organs he gave the name "duumvirate," to indicate that therefrom is the government of the whole body.

Against the doctrine of the four humours van Helmont fulminated, though, as we have already seen, it was not possible for him to free himself entirely from all the errors of the orthodox medical teaching of his day, from which his notion of the passage of a secretion from the spleen to the stomach was presumably borrowed. In particular he accused the Galenists of treating the bile as an excrement. Van Helmont—as we shall see in a moment—grasped something of the true nature of this fluid and the important part it plays in digestion, and his arguments against the view that it is excrementous are both ingenious and convincing. He regarded the bile as being made in the gall-bladder (which he called "a noble bowel"), "materially of the pure blood of the Liver, and efficiently by the proper Archeus of the Gaul."¹

Van Helmont's great contribution to physiology is the theory he puts forward concerning the nature of digestion, which, in spite of many defects, is in some of its features identical with that held to-day. According to the current view

¹ "A Passive Deceiving and Ignorance of the Schooles, the Humourists," ch. iii, § 14. *Oriatrike*, p. 1048.

of his time the prime agent in digestion was thought to be heat: digestion was envisaged as a process of coction, achieving the solution of foodstuffs in a manner similar to that in which the housewife prepares soup from meat and vegetables. Van Helmont points out the impossibility of this. He indicates that the powers of digestion are not only different in different animals, but even in different individual members of the same species, which would hardly be the case if heat were the sole agent effecting it. Certain animals, at any rate, can digest substances which by no mere process of cooking can be reduced to a solution. Moreover, in fevers, when the heat of the body is increased, the powers of digestion are not improved, but rather impaired. With true insight, van Helmont likens the process of digestion to that whereby wine is made from grapes or beer from barley. By means of fermentations the archei of foods are conquered by the digestive archeus of man, and nourishment is transmuted into blood. He writes: "Heat is not the Authour of digestion, but there is a certain other vitall faculty which doth truly, and formally transchange nourishments: And that I have designed by the name of Ferments," wisely adding, "but there are many Ferments in us."¹ Previous writers, as Sir Michael Foster indicates in his lucid exposition of van Helmont's physiological doctrines, "had caught hold of the phenomena of the fermenting

¹ "Heat doth not digest efficiently, but only excitatively or by way of stirring up," §§ 29 and 30, *Oriatrike*, p. 202.

wine-vat, as being, though mysterious in themselves, illustrative of the still more mysterious phenomena of the living body": van Helmont made it the basis of his system, and "was the first to attempt a connected exposition of these matters."¹

The nature of fermentation is still very little understood. Ferments appear to be highly complex chemical substances which are capable, under suitable conditions, of causing certain specific chemical reactions to take place in quantities of other substances quite disproportionately large in comparison with that of the ferment. The alcoholic fermentation of grape-sugar and of malt, as well as the various complicated processes constituting digestion, are known to be achieved by means of such substances. The various ferments have, in many cases, been isolated, and the precise conditions under which they act and the changes they effect have been discovered. But modern science is not really much wiser as concerns the rationale of their action than was van Helmont.² It is especially

¹ Sir Michael Foster: *Lectures on the History of Physiology during the Sixteenth, Seventeenth and Eighteenth Centuries* (Camb., 1901), p. 135.

² The following very brief account of the digestive ferments in man may be of interest to the general reader. The first of the ferments which comes into operation is ptyalin, which occurs in the saliva and causes the conversion of starch into malt-sugar. The gastric juice contains two ferments, pepsin and rennin. This juice is secreted by the mucous membranes of the stomach as required and contains about 0·2 per cent. of hydrochloric acid. In the presence of this acid, pepsin converts other proteids into a very soluble proteid called peptone, whilst rennin causes milk to clot. The pancreatic juice, secreted by the pancreas and dis-

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to his credit that he clearly realised that fermentation is a process far more complex and subtle than are ordinary chemical reactions. A ferment will act, according to him, only under special conditions peculiar to itself; thus, the ferment in the stomach, for example, will act only in a sour or acid solution, whilst the bile, on the other hand, is salt, or, as we should now say, alkaline, which alkalinity is necessary for the operation of its own ferment, but is inimical to that of the ferment of the stomach. All this is in close agreement in every particular with the teachings of modern physiology. Van Helmont, however, never suspected the presence of a ferment in the saliva, and he was unacquainted with the functions of the pancreas.

Digestion, according to van Helmont, is accomplished by means of six processes. The first digestion takes place in the stomach, where charged into the duodenum, contains three ferments, which respectively convert starch into sugar, change other proteids into peptone, and effect the saponification of fats. The pancreatic juice is alkaline, owing to the presence in it of sodium carbonate, and its ferments are only effective in an alkaline medium. Bile also is alkaline. This is secreted by the liver, stored in the gall-bladder and discharged into the duodenum, when required, together with the pancreatic juice. Along with other constituents, it contains certain salts which facilitate the saponification of fats. During absorption in the small intestine, the malt-sugar undergoes a further fermentation, being changed into glucose, whilst the peptone is converted into the special proteids of the blood. The undigested foodstuff undergoes a final fermentation in the large intestine, where it is converted into fæces by the agency of certain micro-organisms.

The ferments producing alcoholic fermentation are, of course, as van Helmont realised, quite different substances from the ferments effecting digestion.

the food is acted upon by the peculiar ferment which the spleen discharges into the stomach, and which acts in an acid solution. When this digestion is completed, the pylorus allows the passage of the sour cream (or, as we now say, chyme) into the duodenum, where its acidity is neutralised by the bile and a further digestion is accomplished by means of the biliary ferment. The third digestion is accomplished by means of a ferment supplied by the liver, and, beginning in the mesenteric veins, is completed in that organ. By means of this digestion, the archeus of the food is finally subdued, and the alkaline chyle is converted into venous blood. Aselli, we may note, had already announced his discovery of the lacteals, but van Helmont makes no use of it; and his theory of digestion as concerns the third, fourth and fifth stages is largely hypothetical. It is interesting to note, however, that he says that the fæces are formed from the refuse of the food incapable of absorption by the mesenteric veins by means of a further fermentation in the large intestines.

By means of the fourth and fifth digestions, according to van Helmont, the venous blood of the liver is successively purified, being first converted into arterial blood and then vitalised. He does not very clearly distinguish between the two processes. His view appears to be that this purification commences whilst the venous blood is passing from the liver to the heart, and is completed in the latter organ. The agent is the vital spirit which, always present in the left

ventricle of the heart, is able to percolate through the septum into the right ventricle, where, acting as a ferment, it transmutes the blood into its own nature. As we have mentioned, he supposes the blood to pass from the right to the left ventricle, but not otherwise. The air taken into the lungs by the act of breathing, he assumes to act as an incentive to this purificatory fermentation of the blood.

His sixth and last digestion occurs in the various members and organs of the body. Each of them contains its own ferment by means of which the nourishment proper to each is prepared from the blood. He writes :

“At length the sixth and last Digestion is perfected in all the particular Kitchens of the Members: And there are as many stomacks, as there are members nourishable. Indeed, in this Digestion, the in-bred spirit in every place, doth Cook its own nourishment for it selfe; under which Digestion, as there are divers dispositions incident, so also divers errors of those dispositions do happen: And so the diseases which the Schools do attribute unto their four feigned humours, should rather be owing unto things transchanged: But I call things transchanged, dispositions, which afterwards do in the Arterial blood, consequently succeed into the true nourishment of the solid parts.”¹

Sir Michael Foster well describes this sixth digestion as “a remarkable generalisation, by

¹ “A sixfold digestion of humane nourishment,” §§ 67 and 68, *Oriatrike*, p. 219.

which van Helmont leaps ahead, and anticipates conclusions which were not reached until many a long year after him." ¹

The watery part of the blood, or serum in the terminology of modern science, van Helmont calls the "latex." It is "the one only humour." "The Schools indeed," he writes, "have made mention of it under the name of the Whey of the Blood, and have made it common as well to Urine as to Sweat." ² His own views concerning this substance mark a great advance on those of the Galenists. Latex, he points out, must be included amongst, not "Excrements, but profitable juices." It is only when it has undergone a specific fermentation in the kidneys that latex becomes urine; whilst sweat is latex that has washed out from the body "a superfluous salt." Altogether, van Helmont's work on the latex ranks with that on digestion as a contribution to physiological science of the greatest value.

(b) PATHOLOGY

On the basis of the physiological doctrines we have sketched above van Helmont erected his theory concerning the cause and cure of disease. He clearly realised that a study merely of the symptoms of a disease was not adequate to its mastery, and that it was necessary to trace diseases to their first beginnings and to lay bare their roots. Disease, he held, is not merely a negative thing, not merely a defect of structure

¹ *Op. cit.*, p. 140.

² "The Humour Latex, neglected," § 2, *Oriatrike*, p. 373.

or function ; nor can any disproportion in the humours of Galenical theory be assigned as its cause. A dead man, in his opinion, cannot correctly be said to suffer from a disease. Disease is something that attacks life ; and must therefore have its roots in the seat of life, that is, the archeus. Diseases, according to him, fall into two categories, namely, (i) those that are produced through some inherent defect in the archeus—such as all hereditary diseases—and (ii) those which arise as a result of some external agent, which, stirring up a morbid idea in the archeus, causes it to deviate from its normal activity and behave in a harmful manner. Amongst such external agents, the operations of witchcraft are assigned a place of importance.

All diseases, therefore, according to van Helmont, have their seat in the archeus. He writes as follows :

“ A Disease therefore is a certain Being, bred, after that a certain hurtful strange power hath violated the vital Beginning, and hath pierced the faculty hereof, and by piercing hath stirred up the Archeus unto Indignation, Fury, Fear, &c. To wit, the anguish, and troubles of which perturbations do by imagining, stir up an Idea co-like unto themselves, and a due Image : Indeed that Image is readily stamped, expressed, and sealed in the Archeus, and being cloathed with him, a Disease doth presently enter on the stage, being indeed composed of an Archeal Body, and an efficient Idea : For the Archeus produceth

a damage unto himself, the which when he hath once admitted, he straightway also afterwards yields, flees, or is alienated, or dethroned, or defiled through the importunity thereof, and is constrained to undergo a strange government, and domestically to sustain a civil War raised up on himself; indeed such a strange Image, is materially imprinted, and arising out of the Archeus: A true Disease Being I say, which is called a Disease.”¹

Van Helmont rightly teaches that to cure a disease it is useless merely to alleviate its symptoms; what is necessary is that such remedies shall be used as will act upon or influence the archeus. He writes:

“A Disease is primitively overcome, by extinguishing of the Idea, or a removal of the essential matter thereof. 2. Originally, by allaying and pacifying of the disturbed Archeus. And 3. From a latter thing; to wit, if the occasional matter be taken away, which stirs up a motive and alterative Blas of entertainment, that the Idea or Disease, may be efficiently made.”²

Such views as these may seem somewhat fantastic to modern thought, but they mark a great advance upon those of the ancients, and in certain respects approximate to those of modern science. As Mr. E. T. Withington well points

¹ “The birth or original of a Disease Image,” § 2, *Oriatrike*, p. 552.

² “A Disease is an unknown Guest,” § 77 (5), *Oriatrike*, p. 500.

out, "there is much valuable truth" in van Helmont's pathological doctrines when they are "divested of the fantastic language" in which their author expressed them¹; and van Helmont's detailed application of these doctrines to the various diseases which he investigated contains much that is interesting and even illuminating.

As we have seen, he wrote special treatises on Fevers, the Disease of the Stone, and the Plague; and there are interesting chapters in his collected works dealing with other diseases, such as dropsy, gout, and what the Galenists called "catarrh." Concerning the dropsy, he writes as follows:

"The Dropsie therefore, is a Disease occasionally arisen from a bloody depraved matter, as it were from a fermental Beginning: at whose incitements, the Archeus of the Reins formeth an Idea of indignation; through the power whereof, he shuts up the Urine-pipes, and Veins, corrupts and diverts the abounding Latex [serum], and transmits this Latex into the compass of the Abdomen or nether part of the Belly; in the mean time he so straitens the pores of these Membranes of the Abdomen, that they can let nothing of all thorow them even until Death."²

Gout, according to him, arises through anger of the archeus of the stomach, causing it to disperse the acid digestive fluid into remote places of the body, thereby producing a "sickness of

¹ Edward Theodore Withington: *Medical History from the Earliest Times: A Popular History of the Healing Art* (London, 1904), p. 307.

² "The Dropsie is Unknown," § 42, *Oriatrike*, p. 520

the joints.”¹ Pleurisy has a similar origin: “for as sharpness [acidity] in the stomach, is an acceptable, and ordinary savour; so out of the stomach all sharpness is besides nature, and hostile, which,” adds van Helmont, “hath been hitherto unknown in the Schools.”²

His views concerning “catarrhs” and allied complaints are of much interest. The Galenists regarded various forms of catarrh as the result of phlegm distilling to the head and there becoming condensed. Van Helmont ridicules this theory. The mucus of the nose and throat, according to him, is produced by a local archeus, its object being the protecting of the tissues from irritation. Excessive irritation, however, causes this archeus to behave recklessly. He becomes, in van Helmont’s quaint language, “an erring watchman or wandering keeper,”³ and produces mucus or phlegm in too great abundance and of bad quality, the voiding of which entails coughing, spitting and other unpleasant effects.

Van Helmont’s treatment of fevers has much in it that is commendable. The currently held opinion that, in fevers, the blood undergoes putrefaction he rightly rejects. Heat, he indicates, is not the cause of a fever, but one of its symptoms, due to the disordered activity of the

¹ “Short Life,” and “The Disease that was antiently reckoned that of delightful Livers,” *Oriatrike*, pp. 747 *et seq.*, and pp. 386 *et seq.*

² “A Raging or Mad Pleura,” § 14, *Oriatrike*, p. 395.

³ “An erring watchman, or a wandering keeper,” and “The Toyes or Dotages of a Catarrhe or Rheume,” *Oriatrike*, pp. 254 *et seq.*, and pp. 429 *et seq.*

archeus. The archeus attempts to throw off the enemy that is attacking it by rigours and trembling, but, not being successful, becomes enraged and thus produces feverish heat. As Mr. Withington has ably put it, well bringing out the essential truth in van Helmont's theory, "Fever is the effort of the chief Archeus to get rid of some irritant, just as local inflammation is the reaction of the local Archeus to some injury."¹ The intermittent character of certain fevers, according to van Helmont, is due to the fact that the archeus, like a wrestler, pauses to take breath, in order that he may the better "shake off the Fever his enemy."²

His work on the disease of the stone is not less interesting. Paracelsus, observing the formation in wine-barrels of a hard deposit from the wine—tartar, or argol³—assumed the presence of this or of allied substances in food and drink generally, and attributed thereto the causation of many diseases, especially that of the stone. The term "tartar" as applied to the incrustation which forms on the teeth is a remnant which still persists of the Paracelsian doctrine. This theory of tartar as present in all food and drink and as a cause of disease, van Helmont hotly contested. He pointed out that the tartar of wine could be dissolved by boiling water, which is not true of stones formed in the bladder. He sought by chemical means to arrive at a true understanding

¹ *Op. cit.*, p. 306.

² "A Treatise of Fevers," ch. ix, §§ 1-6, *Oriatrike*, pp. 973 and 974.

³ The substance is crude potassium hydrogen tartrate.

of the nature and cause of these stones: and although the chemistry of the seventeenth century was not sufficiently advanced for him to achieve success, he certainly pointed the direction in which more successful research was to proceed. He was, we should mention, the inventor of an improved catheter.

The Plague, according to van Helmont, is caused by a poisonous gas, which stirs up an idea of terror in the archeus. But it may, he says, result as the product of foreboding and the terror of infection alone, for the imagination is of exceeding potency, as is evident, to use an illustration he employs on numerous occasions, in the case of a pregnant woman, who, through her imagination, imprints on her offspring a mark, such as that of a cherry. His work on the Plague is marred by many superstitious notions, such as the belief that a useful "zenexton" or prophylactic can be made from dried toads, and cannot, perhaps, be regarded as so useful a contribution to medical science as his other medical writings.

(c) THERAPEUTICS

In view of the importance attached to the stomach and the function of digestion in the physiology of van Helmont, we might naturally expect him to have been a keen dietetist. Such, however, was not the case. Scoffing at all others, he laid down one rule of diet only, namely, that of moderation:

"Let the Supream defence of Long Life (although it be a cruel thing to those that are

unaccustomed) be Sobriety: Otherwise, those things which favour, do nourish best; and a hungry Man will easily concoct those Foods which do favour him most.”¹

If, however, as seems to be the case, van Helmont failed to appreciate the importance of dietetics, which was not unrecognised by other physicians of his day, he more than compensated for this by his exposure, in his work on Fevers and elsewhere, of the gross folly of the blood-letting and purging which for long had been, and still were, the two most favoured means of treatment for almost every ill to which flesh is heir. On one occasion he wrote that he feared that “unless the Lord shall avert it . . . the Life of Mortals will dayly be shortned, and at length to pass unto the Grave in its green eare, through the Offence of Cutting of a Vein, and Purgings,”² and in one of his denunciations of the physicians of his day, he declared that “a bloody Moloch” sits “president in the Chairs of Medicine.”³ His fear was not an exaggerated one; his indictment of the Galenists not unjust. Blood-letting and excessive purging, those fetishes of old-time medical practice, must have claimed innumerable victims, many of whom, perhaps, might have recovered from their illnesses by means merely of Nature’s recuperative powers unaided; and the science of medicine is under a deep debt of gratitude

¹ “A Sixth Paradox,” § 6, *Oriatrike*, p. 702.

² “A Preface,” *Oriatrike*, p. 631.

³ “A Mad or Raging Pleura,” § 34, *Oriatrike*, p. 399. Cf. “The Toyes of a Catarrhe or Rheume,” § 35, *ibid.*, p. 439.

to van Helmont for pointing out how brutal and pernicious these practices were and for indicating better means for the combatting of disease.

Although van Helmont differed from Paracelsus in so many points, both in his views concerning the origin and nature of disease, and in his chemical theories, yet he appears to have followed him very closely in his therapeutics. It was Paracelsus, in all probability, who first introduced the use of laudanum in medicine, and to him especially is due the employment of mercurial and antimonial preparations as internal remedies, a practice violently condemned by the Galenists, who indeed hardly dared to use such drugs externally. Van Helmont made considerable use of these valuable and potent medicines; and wine, also, he highly commended. These, according to him, are such agents as serve to pacify and to appease the archeus, to regulate its functions and, above all, to assist it in overcoming the powers of disease. He also employed many other medicines of diverse character, including herbal preparations, concerning which much curious and interesting (if not always entirely reliable) information is to be found scattered in his works. But he cordially detested the concoctions of the apothecaries of his day, nauseating to the taste and composed, in many cases, of innumerable ingredients, compounded together in the hope that if one did not effect a cure another would; and, like Paracelsus, he roundly accused the apothecaries (altogether justly) of adulterating their drugs.

Some medicines, such as spices, van Helmont tells us, act on the archeus by means of their sweet odours or pleasant tastes. Certain drugs remove impurities; others, he writes, "do move the Archeus, not so much by cleansing and sequestering Impurities, as by appeasing his Grievs, Disturbances, and a continual and successive substituting of Nourishing Idea's."¹ It is especially interesting to note that he suggests the use of alkaline substances in the treatment of those maladies he considers to be due to an excess of acid, such as gout and pleurisy; whilst in the case of fevers he wisely advocates sudorifics, such as mercurials.

Van Helmont is somewhat reticent in his writings concerning the preparation of the more important of the remedies he used. He praises highly the Arcana or secret remedies of Paracelsus, three of which, namely, the Liquor Alkahest,² the Tincture of Lile (an antimonial preparation) and Diaphoretic Mercury, he says are capable of curing every disease. The preparation and properties of the last mentioned, which he also calls "Horizontal Gold," are described in chapter xiv of his treatise on Fevers, and some further particulars are given in chapter viii of the

¹ "In Words, Herbs, and Stones, there is great Virtue," *Oriatrike*, p. 583.

² It is to be regretted that modern commentators have, in many instances, so far misinterpreted the somewhat hyperbolic language of the alchemists as to assign properties to this preparation which were not really claimed for it by practical men like van Helmont, and which it is easy to show it could not possess. Van Helmont's Liquor Alkahest was possibly a strong solution of potassium carbonate.

work on the Disease of the Stone. The account is not particularly clear, but apparently the drug was mercurous chloride or calomel. Concerning the manner of making the Liquor Alkahest and the Tincture of Lile, van Helmont is silent. Others, he says, must learn philosophy as he has done, namely, by experiment. He writes:

“For God sels Arts to Sweats. For nothing in Alchymical things is written to that intent that they may be promiscuously understood by all, but onely, that they may not be understood: And that thing, Chymistry hath alwayes observed singular to it, before other Disciplines, by the Command of God; least Roses should be spread before Men, and Swine: For our Writings are in stead of Exhortations, that every one may profit by his own Labours, as much as shall be indulged him from above.”¹

Another remedy he favoured was mercuric oxide (red oxide of mercury), which he called “Arcanum corallinum,” no doubt because of its colour.

(d) THE ELIXIR OF LIFE

In common with other alchemists, van Helmont believed in that marvel of old-time medical theory, the Elixir of Life. But in contradistinction to the majority of them he denied it to be the same substance as the Philosopher's Stone or a preparation thereof. It is distinguished by him from the Arcana of Paracelsus, as being, not a

¹ “A Childish Vindication of the Humorists,” § 5, *Oriatrike*, p. 523.

drug for the curing of disease, but a means of preserving life and its faculties unimpaired by the ravages of age.

Van Helmont says that this Elixir can be obtained by extracting the essential essence of the wood of the imperishable cedar of Lebanon by means of the Liquor Alkahest of Paracelsus. Another preservative of life that he mentions is the distilled liquor of sulphur, *i.e.* a solution of sulphurous acid. He says that, in the year 1600, a man, then fifty-eight years old (concerning whom the name and some particulars are mentioned), begged of him "some defence of life." He prescribed a daily dose of two drops of this liquor, and records that as a result of its use the man was alive and in good health forty-one years later, without having experienced any illness in the meantime.¹

To cure disease and to preserve life: such are the great objects of medicine; but the philosopher is continually haunted by the question, What is this mysterious something which we call Life? Van Helmont compares it to light. "The life of man," he says, "is a formall light," pointing out, however, that this is an analogy only, and not altogether satisfactory. Of life itself he writes as follows:

"Although God had shewen to any one the essence of life in a composed Body; yet he will never give his own honour of teaching it, unto any Creature; Seeing life in the abstract, is the incomprehensible God himself."²

¹ "The Tree of Life," *Oriatrike*, pp. 813 and 814.

² "The Blas of Man," § 22, *Oriatrike*, p. 179.

Perhaps this is the only answer possible to the great question "What is life?" and perhaps this is the answer which biological science—although its present mien may seem somewhat materialistic—may ultimately achieve.

We suppose that the works of van Helmont are rarely if ever read nowadays, save perhaps by those who have made the history of science their especial concern. Indeed, it must be confessed that many of his chapters are tedious reading, dealing as they do with forgotten controversies that have lost their significance. Nor does the manner of Franciscus Mercurius's editing (or rather lack of editing) add to their attractiveness. The latter seems, indeed, to have flung together the various chapters, both of previously published books and those which were new, with little if any regard to their contents, and with no indication as to the order in which they were written. The patient reader of these works, however, will certainly not be unrewarded. Apart from their great scientific interest, the revelation they provide of a noble character—remarkable for loftiness of motive and sincerity of purpose—of a man altogether animated by the desire to do good to his fellow-men, a true and impassioned lover of God—is of great and permanent value. Moreover, ever and anon van Helmont's genius flashes out, and the reader cannot but be astounded at his originality. Never was man less afraid of unorthodoxy, never less anxious to show agreement between his own thought and

that of his contemporaries. He delighted to call his ideas by the name of "paradoxes," and to refer to his doctrines as "unheard of." This, no doubt, was not the best way to gain acceptance for them, and we have learnt what a storm of opposition he aroused. Yet it would be an error to suppose that all his scientific contemporaries were so dense as not to appreciate something of his greatness. "Eirenæus Philalethes" was not alone in his encomium of van Helmont. Nicolas Lefèvre, for example, an alchemist and physician who enriched chemical science with a number of valuable observations, and whose *A Compendious Body of Chymistry* was published in London shortly after van Helmont died, wrote in the Preface thereto: "We should prove ungratefull to our Age, and the memory of a most worthy and charitable Physician . . . if we should passe by unmentioned the *subtil Van Helmont* lately deceased," and, coupling his name with that of the illustrious Glauber, spoke of the two men as "Beacons and Lights which we are to follow in the Theory of Chymistry and the best practice of it." ¹

A light for the guidance of those that came after him: no higher word of praise is possible, and of Joannes Baptista van Helmont no truer word has been written.

¹ Nicolas Lefèvre (Nicasius le Febure): *A Compendious Body of Chymistry . . . Rendred into English, by P. D. C., Esq.* (London, 1664), pp. 3 and 4.

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