

## Paracelsus – physician, reformer, philosopher, scientist

R. Bernoulli

*University of Basel (Switzerland)*

Dr. med. et phil. René Bernoulli lectures on the History of Medicine at the University of Basel, Switzerland.

In view of the dependence of human existence on the conditions of each particular age, it is surely appropriate – before talking about Paracelsus himself – to recall some of the major epochs in the history of medicine. In spite of all the individuality rightly attributed to Paracelsus, it should not be forgotten that he was influenced by the thinking and research of his predecessors.

The history of 'Western' medicine can be roughly divided into three major epochs:

*The medicine of classical ancient Greece and Rome.* This period lasted for about a millennium, from the 5th century B.C. to the 5th century A.D. Its major representatives were Hippocrates (5th and 4th centuries B.C.) and Galen (129–ca.199 A.D.). They and their schools developed many important concepts, some of which are still relevant today, for instance, the Hippocratic oath.

Perhaps their most important contribution was the gradual development of the doctrine of the four humours and of humoral balance. Problems connected with the basic 'principle of life', the *pneuma*, were much discussed around the beginning of the Christian era – and still concern physicians to this day. The composition and the function of the organs was also a subject of study. On the basis of the knowledge acquired – fragmentary and inaccurate though it was – and of philosophical concepts, physicians sought to bring relief and healing to the sick. Galen was probably the most successful in this, with his achievements in surgery; his method for resetting a dislocated shoulder is still in use.

The medicine of the classical period was strongly influenced by Hellenism, and in the Roman Empire, Greek physicians were greatly respected. Provided they were not slaves (which many of them were) they were given Roman citizenship. There were only a few native Roman physicians. Celsus, a native Roman, concerned himself with medical problems but did not practise medicine. His major achievement is the translation of Greek texts into Latin. These translations were later highly valued in mediaeval medicine.

The flora of Greece provided a wide variety of medicaments. Lists exist with some four hundred plant species that were in pharmacological use; unfortunately, not all of them have been identified.

When discussing classical medicine it is essential not to forget pre-Hellenistic medicine. Mesopotamians and

Egyptians were no less knowledgeable in medical science than the Greeks. In connection with Egypt, the name of Imhotep must be remembered: he was not only the architect of the stepped pyramid at Saqqara but also acquired fame as a physician (3rd millennium B.C.). According to some papyri there was already considerable specialization in the Egyptian medical practice of that time.

*Mediaeval medicine.* The long period of the Dark Ages, from the 5th century A.D. onwards, with its massive movements of population, opened a new epoch in medicine. The Germanic tribes that invaded and later destroyed the Roman Empire included 'wise women' and priests with some understanding of medicine, for example of the treatment of wounds. They extended the rather limited repertoire of remedies available with more medicines from native plants. However, the classical ideas and concepts were retained. The numerous monasteries played an important part, since they were the centres of medical practice well into the Middle Ages. The monks were almost the only people able to read the Latin translations of the Greek texts. One of the most valuable contributions of this 'monastic medicine' was the founding of hospitals for the suffering populace.

For several centuries monastic schools were the mainstay of learning. In the gardens of the monasteries the monks grew their own medicinal herbs. Even after the rise of the universities towards the end of the Middle Ages, much of the monastic usage was retained. For instance, it was a rare exception that the physician Wilhelm Cop of Basel received dispensation from celibacy when he was called to teach in Paris.

In 1163 the Church prohibited the practice of surgery by clerics. Barbers had already been performing blood-letting since the 11th century, and now, together with executioners and quacks of all sorts, their guild gradually took over the surgical 'trade'. It was only in the 18th century that surgery gradually came to be recognized as an academic science. In the intervening time, the examination of urine had become a most important diagnostic tool for the physician.

Mediaeval medicine was particularly challenged by the ever-recurring epidemics. Since their causes remained unknown, neither prevention nor therapy was possible. The only available measures were to isolate the sick in hospitals and lock the town gates to protect the

inhabitants. For several centuries, no therapeutic measures were used – apart from fumigation, blood-letting and prayers of supplication.

In the context of mediaeval medicine one should also include Jewish and Islamic medicine. There were outstanding physicians among these peoples, but like their European colleagues, they did not progress beyond the concepts of classical ancient medicine.

*The beginning of 'modern' Western medicine* can, in my opinion, be accurately pinpointed. In 1543, in Basel, Johannes Oporinus published the first edition of Andreas Vesal's pioneering work '*De humani corporis fabrica libri septem*' (Seven Books on the Structure of the Human Body). This publication is the first to describe human anatomy on the basis of objective and unprejudiced observations, and without clinging to the medical dogmas that mediaeval medicine had inherited from the ancient classical period. Undoubtedly, Vesal's writings contained errors, but for the future of medicine as a science the most important point was the final breaking of the spell exerted by Galen's theories, which had prevented any advances in anatomy and thus virtually any research in medicine. One should note here that as Paracelsus died in 1541 he must be numbered among the mediaeval physicians, even though he was undoubtedly a pioneer in certain respects.

Paracelsus' real name was Theophrastus Bombastus von Hohenheim. He was born towards the end of 1493 in Einsiedeln, 'in Switzerland', as he liked to point out. His father, Wilhelm von Hohenheim, illegitimate offspring of the noble family Bombast von Hohenheim in Stuttgart (in present-day Germany), had obtained the degree of Bachelor of Medicine at the University of Tübingen. He settled in Einsiedeln, where he soon became much respected as a physician and medical scientist. He married a bondswoman of the monastery of Einsiedeln called Ochsner. It appears that she died soon after the birth of her son. In 1502, father and son moved to Villach in Carinthia (today a region of Austria), where Wilhelm continued his medical and scientific activities. He died in 1534.

In 1512 we find Paracelsus, as we shall call Theophrastus von Hohenheim from now on, working in the Tyrolean smelting works, where it was his duty to supervise the smelting of the ore. Besides doing this 'laboratory' work, he spent a good deal of time crawling around in the tunnels and galleries of the mines, where he noted in particular the stratification of the rock. His work with metals and crystals, and the dramatic changes produced by the fires in the furnaces, made a deep impression on him and were of crucial importance for his later scientific studies.

Very early in his career, Paracelsus began to lead the restless wandering life that was so characteristic of him. He later claimed to have studied in Italian, French and German universities and to have obtained a doctoral

degree from Ferrara in Italy, but the fact that he never produced a document to prove this, which led to some doubt about whether he really had a degree at all. However, early in this century a document was discovered in the archives of the University of Basel, 'that leaves almost no room for doubt about Hohenheim's doctorate'<sup>3</sup>.

There was scarcely a country in Europe – even including Scandinavia – that Paracelsus did not visit. In 1525 he returned from Italy and went to Strasbourg, passing through Freiburg im Breisgau in Southern Germany on the way. On December 5th 1526 he bought the right to become a citizen of Strasbourg – in the face of opposition from the resident physicians. Towards the end of 1526 or at the beginning of 1527 he moved to Colmar in Alsace, near Basel. Erasmus of Rotterdam, who was living in Basel at the time, evidently heard that Paracelsus was in Colmar, and had him called to Basel to take on the medical treatment of Johannes Frobenius, the printer and publisher, who was severely ill. This shows that Paracelsus was already a highly-respected physician. Frobenius was about to undergo an amputation of one foot, but Paracelsus was able to cure him before this drastic step had to be taken. After this, Paracelsus had an even better reputation in Basel.

The authorities of the city of Basel – though not the faculty of the University – began negotiations with Paracelsus. Sadly, the original documents are missing, and we cannot give any details concerning the agreement reached, but we know that Paracelsus settled in Basel in the spring of 1527. The situation in the city was difficult: an epidemic of the plague had just ended, and furthermore the dispute over the Reformation of the Church was in full swing. Paracelsus had been appointed as Municipal Physician, but it appears that he automatically assumed that he had also been appointed as a full Professor at the Medical School of the University, equal to all other faculty members, and he began lecturing to medical students. Legally he was in error: the city authorities had no jurisdiction over the University. The humanist Aeneas Silvius Piccolomini, then Pope Pius II, had granted the request of the Basel city council on 12 November 1459 and permitted the establishment of a University, in which teachers and students were to have the same privileges, liberties and honours as in Bologna. Standing on its rights, the faculty demanded that Paracelsus must formally matriculate in the University, according to University regulations, and must present his certificates, in particular his doctoral diploma from Ferrara. True to his nature Paracelsus refused to do either.

The controversy concerning his right to appoint new faculty members was particularly heated. As, legally, Paracelsus was not a member of the University, he had no right to appoint new teachers – which enraged him.

Even worse, he did not teach in Latin, as was the custom, but mostly in German, which was regarded as scandalous. This view was not altogether unjustified; at that time, the German language was ill-suited to the teaching of medicine, because it lacked the relevant vocabulary. Paracelsus overcame this difficulty by liberally inserting Latin expressions into his lectures, which certainly made them even more difficult to follow. And in any case, the University complained bitterly about his lecturing to students, since he was not a member of the faculty.

The dispute was settled by giving Paracelsus permission to use the University premises and to lecture, but refusing him membership of the faculty and the governing body of the University, and permission to award doctoral degrees.

One morning the inhabitants of Basel found handbills posted all over town, as was customary at that time. The text began with the provocative assertion that medicine was in a decline. Paracelsus, the author, then continued: *'But we will deliver it (i.e. medicine) from the gross errors. Not by following the teaching of the ancients, but by our own observation of nature, confirmed by long practice and experience. We all know only too well that most doctors today make grave errors to the detriment of their patients. This is because they anxiously cling to the words of Hippocrates, Galen, Avicenna, and others. . . . I explain publicly for two hours every day with great assiduity and for the greatest benefit of my audience books on practical and theoretical medicine, on internal medicine and surgery, of which I myself am the author. I have not copied out these books from Hippocrates or Galen, as others have done, but I have created them by ceaseless efforts, based on my own experience, which is the most authoritative teacher of all. And if I prove anything, it will not be by quoting the authorities, but by experiments and reasoning. Thus, if one of you, my valued readers, feels the urge to penetrate these divine secrets, if he wishes to learn all of medicine in a short time, then let him come to me in Basel, and he will discover much more than I can say here in a few words. To explain myself more clearly, let me state for instance that I do not believe in the teachings on complexions and humors of the ancients, who erroneously use them to explain all diseases. I forbid all to pass sentence wantonly on Theophrastus before having heard his teaching. Farewell, and examine benevolently our attempt to reform medicine. Basel, 5 June 1527.'*<sup>7</sup>

Not only the Professors of the University, but also the good citizens of Basel, must have been astounded at this challenge to accepted medical tradition. An attack on the established authorities of the past was hardly calculated to reduce the tensions that already surrounded Paracelsus' presence in Basel. Furthermore, this kind of self-advertisement would have been considered most unbecoming for a physician.

Unfortunately, it was part of Paracelsus' character to present his concerns in blustering words. Even though he may have been justified, this led to frequent misunderstandings. The events surrounding the beginning of his time in Basel had been tense, and at times dramatic. Its end was to be no different.

His final departure from Basel was precipitated by a dispute over salaries. He had cured the canon Cornelius von Lichtenfels, who had been suffering from a digestive disorder, and when the time arrived for payment of the honorarium, allegedly agreed upon beforehand, Lichtenfels disputed the sum named by Paracelsus. The courts found in favour of the canon. Paracelsus proceeded to vent his fury both verbally and in writing. He was now even at risk of imprisonment. In the end he preferred flight: in the spring of 1528 he left Basel under cover of darkness and returned to Colmar. Without doubt, his choleric temper caused trouble for Paracelsus at other Universities too. For example we find him in 1517 in Montpellier (France), where some of the medical professors were developing new pharmaceuticals<sup>4</sup>. These colleagues of his must have been severely angered when they were shown the following text: *'... you must follow me, with your Avicenna and Galen, . . . and not I follow you; you must follow me, you from Paris, from Montpellier, from Salerno, from Vienna, from Cologne, from Wittenberg, all of you in the highest positions, and none can be left out, not even those from the lowliest bathhouses . . .'*

Let us leave the biography of Paracelsus here. If the period in Basel has been treated in most detail, that is because it is more extensively documented than other periods of his life<sup>3,5</sup>. However, we can well imagine that his lively advocacy of his convictions will not have made his life any different in the other towns in which he resided.

Paracelsus died on 24 September 1541, at 48 years of age, during his second stay in Salzburg (Austria), where he had been called by the Prince Bishop. It is possible that he suffered from cirrhosis of the liver combined with nephritis as a result of exposure to the fumes produced by his experiments with arsenic and mercury. Before his death he bequeathed all of his possessions to the poor. According to his wish he was buried in the cemetery of St. Sebastian in Salzburg, the last resting-place of the paupers. We find his gravestone today in the north portal of St. Sebastian's church.

The two passages of Paracelsus' writings quoted above demonstrate their author's very critical stand concerning the ideas of ancient medicine, which were still the guidelines of physicians in mediaeval times. In the 16th century Hippocrates, Galen and Avicenna were still firmly in their places among the coryphaei of medicine, even though mediaeval physicians had made a certain amount of progress. It must furthermore be taken into account that Paracelsus' criticism of ancient

medicine did not mean that he had discarded its doctrines entirely.

As was customary in his time, Paracelsus based his medicine very largely on his philosophical convictions. He does not doubt the existence of cosmological, theological, physical and chemical analogies to medicine. All through the Middle Ages similar ideas were voiced. The writings of Paracelsus contain contradictions, not excluding his views on therapies. Thus he did not take a clear position on one of the two important but contradictory teachings on the treatment of disease in his time: 'Contraria contrariis curantur' (the opposite is cured by the opposite), and 'similia similibus' (the same by the same). Paracelsus' indecision in this matter is evidence of his ability to adapt to the requirements of the nosological situation<sup>6</sup>. Paracelsus subscribed to the latter idea in general. However, he also considered opposites to be of great importance. Antagonism can also lead to truth and understanding: good cannot be recognized without understanding evil, nor God without the Devil. Paracelsus drew the conclusion that in medicine it is essential to separate the pernicious from the healing principle. This concern is particularly relevant to us today: the abuse of tobacco and drugs, excessive sunbathing, and the irresponsible use of medicines are just some examples. 'Nil nocere' (no harm may be done) must remain a keynote of medical practice.

A more detailed study of the philosophy of Paracelsus is not altogether straightforward. His thinking is not always free of contradictions, and he tends to lose himself in a maze of theses and antitheses which defies clarification. Nevertheless, two further highlights of his philosophy should be summarised here, concerning his fundamental ideas about chemistry and about the way in which knowledge is arrived at.

It would be wrong to accuse Paracelsus of having discarded all the views and opinions of his contemporaries based on ancient teachings. For example, he accepts the concept of the four elements: earth, water, air and fire. But he does not consider that these four elements can account for the immense variety that exists in the natural world.

Experience shows that all materials are subject to change. In order to explain the events resulting from chemical processes, Paracelsus postulates three further elements: sulfur, mercury and salt. In all matter and in all reactions sulfur represents the inflammable part, mercury the volatile and salt the sediment or ash. These components of the 'substance' of every object become apparent when the object discards its material aspect. For example, when wood burns, flames and smoke are produced and ashes remain. According to Paracelsus, we find ourselves in the presence of a number of archetypal properties of matter, which force the object we actually observe – in this case, the log of

wood – to 'realise' the corresponding 'qualities': sulfur mutates the wood to flames, mercury produces the volatile smoke, and the ashes are the incombustible remainder, the salt<sup>6</sup>.

Modern scientists must obviously avoid identifying these 'elements' with the modern chemical elements S and Hg, and the modern definition of 'salt'. Paracelsus considers these three 'elements' to be constituents of all things, but certainly not as chemical components or even impurities. On the contrary, each of these elements represents a particular principle, which gives a particular property to the object in question. The constitution of the object is, according to Paracelsus, dependent on the particular structure of each element, which is not constant. He therefore refers to different 'sulfurs', 'mercuries' and 'salts', and implies that cosmic forces may have influenced the particular properties they show. We have to admit that here it becomes difficult, if not impossible, for us to follow Paracelsus' thought-processes.

Without a doubt, Paracelsus was a serious scientist, who honestly attempted to unveil the secrets of the hidden processes underlying natural events. He was by no means a friend of traditional medicine. He considered that its adherents spent most of their time at the bedsides of their patients in reflection – when they were not occupied with uroscopy. Their main concern was that their treatment should follow the teachings of the ancient masters as closely as possible. The outcome of such consultations was almost always blood-letting performed by a barber, or vigorous cupping.

Paracelsus challenged these ineffective therapeutic measures by proposing another procedure: attempting to elucidate the nature of the disease. In his view, only when the physician knew the nature of the disease could he actively treat it with the antidote. To reach this goal, careful observation and one's own experience, 'experientia', were needed. If both failed, or doubts arose as to the adequacy of the conclusions, the method of experiment – 'experimentum', the test – leading to 'experientia', must be called on. These principles, so highly valued by Paracelsus, have never again disappeared from the process of medical research. However, important though this is, it does not seem to me to justify calling Paracelsus 'a physician of our century', as has sometimes been done recently. He was and remains a mediaeval physician of genius, who made his own contribution to the progress of medical science.

Paracelsus left us a considerable literature. Most of his treatises are, today, part of the history of medicine and chemistry. In contrast, his writings on ethical principles are only very briefly discussed in the recent flood of Paracelsus literature, although they still are of current interest<sup>2</sup>.

Everyone who engages in a study of Paracelsus will inevitably form his own picture of him. In my opinion, the following appeal reflects the culmination of Paracelsus' reflections:

'Alterius non sit, qui suus esse potest'

(do not be someone different, if you can be yourself).

This axiom touches the personal existence of each one of us<sup>1</sup>.

Translated from the German by H. P. von Hahn and J. M. Jenkins

- 1 Bernoulli, R., Montaigne und Paracelsus. *Gesnerus* 49; 3/4 (1992) 311–322.
- 2 Bernoulli, R., Ueber das Sozialethos bei Paracelsus. 1994 in press.
- 3 Burckhardt, A., Geschichte der medizinischen Fakultät zu Basel 1460–1900, pp. 24–31. Verlag Friedrich Reinhardt, Universitätsdruckerei, Basel 1917.
- 4 Dulieu, L., La médecine à Montpellier, tome II, La Renaissance, pp. 139, 156, 172. Les Presses Universelles, Avignon 1979.
- 5 Kaiser, E., Paracelsus in Selbstzeugnissen und Bilddokumenten. Rowohlt's Monographien, Reinbeck bei Hamburg 1976.
- 6 Pagel, W., Paracelsus. An Introduction to Philosophical Medicine in the Era of the Renaissance. 2nd revised Edition. Karger, Basel–New York 1982.
- 7 Sigerist, H., Grosse Ärzte, p. 91. 6th ed. J. F. Lehmann Verlag, München 1970.