

The pioneer of pulse science — Józef Struś/*Iosephus Struthius* (1510–1568)

Fascinated by the possibilities of science and by new methods, we are frequently unaware how distant the roots of modern medical knowledge may be. It may appear that past observations, apart from the archaic language in which they are couched, sometimes consist of current verities.

Nowadays we are perfectly aware of the significance, at least prognostically, of heart rate variability. We can record and analyse it precisely. But as early as the third century A.D. the Chinese physician Wang Shuhe wrote: “If the pattern of the heart beat becomes as regular as the tapping of a woodpecker or the dripping of rain from the roof, the patient will be dead in four days...”. Is this not a description of the prognostic value of accelerated low heart-rate variability, which we now know to be crucial? The difference lies in the method of examination. In the 16th century Iosephus Struthius (Józef Struś), a physician from Poznań, used the method of pulse examination for precise clinical diagnostics.

He was born in 1510 in Poznań, Poland. After graduating from the Faculty of Humanities in his native city, he went on, between 1525 and 1531, to study philosophy, mathematics, astronomy and Greek, among other subjects, and above all, medical sciences at the Jagiellonian University of Cracow, Poland. These broad interests enabled him to put into practice his principle that one may become a good physician only after gaining knowledge in other fields, including physics and astronomy. He received the title of Bachelor in 1529 and two years later that of Master of Arts. He embarked on studies in the field of medical sciences at Padua Academy in 1532 and completed a doctorate in philosophy and medicine in 1535. He was then appointed Professor of the Faculty of Philosophy and Medicine of the University of Padua. In 1537 he was brought to the University of Cracow to lecture at the Artium Faculty.



Struthius came to be appreciated more and more as a physician as well as for his academic work. He was associated with a number of honourable posts such as that of physician to the Hungarian Queen Isabella (the wife of King Jan Zapolya) and to the Polish King Sigismund Augustus, a position he held until the end of his life. Dr. Struthius' must have enjoyed great fame, as he was

called to the bedside of the Sultan of Turkey, whom, we are told, he was successful in helping. He also received an invitation to become physician to the Spanish King Phillip II.

On 1555 Struthius's monography, entitled *Sphygmicae artis iam mille ducentos annos perditae et desideratae Libri V*, was published in Basle. Its 366 pages contained his experience, especially on the subject of the pulse. There were, above all, clinical observations but, as contemporary authors say, also “comments based on experimentation”. The vivisections performed by Dr. Struthius enabled him, for instance, to submit a proposal concerning the interdependence of the vascular behaviour and the nerves, or what we might describe as the neurovascular reflex. The work consists of five books on the following topics: types of pulse, their diagnosis, their aetiology and their prognostic value. His opinions about the aetiology of the different types of the pulse are similar to those of Galen, although elements of independent investigation may be noticed as well as the criticism that allowed him to notice many mistakes in earlier rules. He introduced after the Greek the definition of the pulse: “The pulse is a function at the beginning of the heart, then arteries that through the diastole and the systole are being in movement...”. He described precisely the method of examination of the pulse by palpation, but an innovatory characteristic is the use of light objects for observation of the movements of the arteries lying below them. He showed a new method of graphical illustration of the pulse

wave and new more detailed descriptions of some types of pulse. He divided the types of pulse into simple and complex. The descriptions of the first were based on the size of the diastole, the quality of the movement, the length of the pause, the strength of the pulse and the quality of the artery. Further designations, including: frequent, rare, fast, slow, are, as we may perceive after more detailed analysis, still encountered in clinic practice. Altogether he distinguished as many as 15 types of simple pulse. He described sex-dependent differences in the pulse, the pulse seen in good health and, in particular, in the diseased body, now frequently understood differently. He points out the benefits of knowing a patient's pulse before the onset of disease. It is like a contemporary preventative examination! His schemes describing the types of pulse, their interdependence and the causes of deviation are impressive. The chapter devoted to prognostication, which illustrates his skill in observation, knowledge and the physician's way of thinking, is the most interesting, making the reader aware that in those times it was a modern work of great practical significance.

We may also, a little facetiously, say that Struthius was a pioneer in the use of methods of assessment of heart response (the pulse) in detective examination, the principle used nowadays in lie detectors. He describes the case of a woman, whom he was examining at a time when her husband was absent and whom he suspected of having fallen in love with another man. When, while examining her pulse, he mentioned in the course of conversation the name of the beloved, he discovered a repetitive difference in the pulse, which confirmed his suspicions.

Struthius, although focusing attention on the examination of the pulse, warns against relying only on this. He places a clear emphasis on taking a pa-

tient's history and performing a clinical examination, including, as used to be a rule, examination of the urine. He gives priority to practical cognition by using the senses, but he also clearly states the importance of argumentation.

It is worth remembering that, as an extensively educated man of his era, Iosephus Struthius did not live as a medical recluse. He was the author of numerous translations of medical and astronomical works, as well as translating poetry from Greek into Latin. He wrote odes and elegies dedicated to his teachers, friends and patrons.

Dr. Struthius received recognition in his own city. He was twice elected mayor. The duties must have been excessively absorbing and did not allow him to pursue his favourite interests, as he obtained release from the obligation to hold administrative positions in the years following by plaguing the King with his entreaties.

Iosephus Struthius died on 6th March, 1568 and was buried in the Collegiate Church of St. Mary Magdalene (now no longer in existence).

Struthius' works, in those days one of the basic sources of medical knowledge, are now among the most significant documents of historical medical literature.

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