

## IGNAZ PHILIPP SEMMELWEIS

1818 -1865

Ignaz Semmelweis is considered to be one of the 10-12 most significant names of global medicine, as the saviour of mothers who introduced a process to ensure the prevention of puerperal fever, one of the most horrible illnesses of his time, which claimed the lives of masses of mothers. This great physician personality of the world, who was a self-proclaimed Hungarian all his life, was the target of numerous attacks, despite his discovery of unparalleled value, or perhaps because of it originating from the attackers' ignoble fear for their positions. The more people attacked, the firmer and more determined Semmelweis remained, defending his discovery with newer and newer data, fully aware of its soundness, validity and importance.

No writer can give a summary worthy of Semmelweis' oeuvre. This is difficult also because as we know well manuscripts always represent a unique value, primarily due to their content but also because they also promote an understanding of the personality of their onetime author. This statement has a special significance in the case of Semmelweis because according to József Antall<sup>1</sup> "Semmelweis is one of the great men who left behind very few manuscripts. The manuscripts of his published book, open letters and articles are lost. But the manuscript of the obstetrics textbook he was working on has also disappeared".

Semmelweis' discovery can be experienced as part of the heritage of scientific knowledge, in not only the Hungarian but the global medical society, primarily through the professional and substantial-in-size work of the associates of the Institute for the History of Hungarian Sciences and the Semmelweis Medical History Museum, Library and Archives, especially through the published document collection. This includes Semmelweis' main work written in the form of a book<sup>2</sup>, his publications, published presentations, as well as the presentations of his achievements by others and the studies that review them.

Having said this, or perhaps despite having said this, since this intends to be a commemoration, let us briefly remind ourselves: what was Semmelweis' discovery?

To begin with we need to highlight that puerperal fever played a significant role among the diseases devastating humanity already in the antiquity and the Middle Ages. According to re-

---

<sup>1</sup> József Antall (1932-1993), prime minister of the third Hungarian republic, first worked as a scientific researcher, then deputy director, from 1974 acting director and from 1985, director of the Semmelweis Medical History Museum, Library and Archives which opened in 1964; in 1986 he became the vice president of International Society for the History of Medicine. As medical historian, he published numerous books on the history of medicine, the oeuvres of notables of medicine. Herein we highlight his collection entitled "Memories of Ignaz Semmelweis" (See also: text section and the reference of the commemoration).

<sup>2</sup> Semmelweis' main work is „DIE AETIOLOGIE”

ports it began to grow to frightening proportions by the end of 17<sup>th</sup> century, when the frequency of fatal cases of puerperal fever suddenly increased. This all started when the first so-called larger scale birth houses were established. As an obstetrician known for digging through professional documents, Semmelweis was most probably aware of this.

In 1844, in Vienna, Semmelweis received not just a medical degree<sup>3</sup>, but also a so-called birthing specialist certificate; a year later he became a surgeon, and Professor Johann Klein (who would later be sceptical of his discovery) chose him for the position of assistant lecturer at his clinic above other applicants, due to his skills and qualifications. Less than two years later (1847) Semmelweis lost his physician friend Jacob Kolletschka, due to sepsis acquired during an autopsy. When reviewing his friend's autopsy report, Semmelweis, who was also versed in autopsy, realized that Kolletschka's cause of death was the same "disease" as the cause of death of those who died of puerperal fever. He described his finding, but the medical community ignored it.

Based on his finding he inferred that puerperal fever at his workplace, the 1<sup>st</sup> Obstetrics Clinic of the Vienna Hospital, was caused by physicians and medical students who examined women giving birth at the clinic right after autopsy room work or practice (autopsy) without disinfecting their hands or changing the clothing they wore in the autopsy room. Comparing the frequency of cases of puerperal fever at the 1<sup>st</sup> Clinic with that of the 2<sup>nd</sup> Clinic – where only midwives who did not perform autopsies worked – his hypothesis was confirmed. The frequency of puerperal fever at the 1<sup>st</sup> Clinic was markedly higher than at the 2<sup>nd</sup> Clinic (Table I). Knowing this, he ordered that everyone had to wash their hands with water containing calcium hypochlorite prior to working or examining patients at the Clinic, and not wear clothing they had worn in the autopsy room.

After Semmelweis fell out of favour (also) as a supporter of the Vienna uprising and the Hungarian revolution and war for freedom, his tenure was not extended, and he returned home from Vienna in 1850. In Pest he began working (in an unpaid position) at the obstetrics department of the Szent Rókus Hospital, then, following his appointment as Professor of the Pest University Faculty of Medicine, he directed the Obstetrics Clinic of the University. At both the Szent Rókus Hospital and the University Clinic he was revered as the saviour of mothers once the effectiveness of his antiseptic procedure became known.

Semmelweis published his findings in his main work „Die Aetiologie”, as well as in the Medical Weekly (1858). The most outstanding personalities with enduring accomplishments (but only they) of the Vienna school, such as Professors Skoda, Rokitansky, as well as the majority (?) of the professors of the Pest University Faculty of Medicine, but certainly Lajos Markusovszky, recognized, supported and (if we may put it this way) promoted the epoch-

<sup>3</sup> *Semmelweis completed his secondary education in 1835 at the Roman Catholic University Grammar School in Buda Castle. In 1835-37 he completed a two-year humanities course at the Pest University of Sciences, then in 1837 he first enrolled at the Vienna University Faculty of Law and in the same year (?) transferred to the Faculty of Medicine. He returned to Pest-Buda in 1838 to the Pest University of Sciences Faculty of Medicine and from 1840 he continued his studies at the Vienna University Faculty of Medicine.*

making significance of Semmelweis' discovery. We are of course also aware that multiple individuals in high positions repeatedly attacked Semmelweis with their unfounded opinions; belittling his discovery, setting it aside as naught. I shall refrain from mentioning their names in this tribute.

TABLE I.

**Number of Fatal Cases of Puerperal Fever at the 1<sup>st</sup>  
and 2<sup>nd</sup> Clinics of the Vienna Hospital**

Year	1 <sup>st</sup> Clinic			2 <sup>nd</sup> Clinic		
	No. of births	Deaths	Rate (%)	No. of births	Deaths	Rate (%)
1841	3036	237	7,8	2442	86	3,5
1842	3287	518	15,8	2659	202	7,6
1843	3060	274	9,0	2739	164	6,0
1844	3157	260	8,2	2956	68	2,3
1845	3492	241	6,9	3241	66	2,0
1846	4010	459	11,4	3754	105	2,8

The number and rate of fatal cases of puerperal fever was significantly higher at the 1<sup>st</sup> Clinic than at the 2<sup>nd</sup> Clinic every single year between 1841 and 1846. Hand washing with water containing calcium hypochlorite (antiseptic process) introduced by Semmelweis reduced the rate of cases at the 1<sup>st</sup> Clinic to 1%, then below 1% (see also later).

It is helpful to present the professional recognition of Semmelweis' discovery as well the criticism of the discreditable accusations it received through the account of the colleague, Lajos Markusovszky, the field surgeon of the 1848 revolution and war for freedom, the founder of the Medical Weekly, first published in 1857 and with an impact factor today, the organizer of Hungarian public health and its most effective mentor. In 1861 Markusovszky analysed Semmelweis' main work, *Die Aetiologie*, in his article published in the Medical Weekly.

In the introduction to his analysis, Markusovszky used elevated tones to praise the significance of the discovery. He stressed that the discovery was of great importance because "the discovered truth had a practical, life-saving effect at the same time". Markusovszky concluded his praise with an expressive simplification and stated: the author (Semmelweis) was henceforth no longer forced to watch idle and disheartened the piles of dying patients".

Thereinafter Markusovszky analysed Semmelweis' discovery in more detail with scientific objectivity. He determined that Semmelweis uncovered the cause of puerperal fever, the source, propagation pathway, carriers of the causative factors, the place and time of "absorption". He further emphasized that Semmelweis' discovery was based on the results of practical works, which were proven one by one – with irrefutable facts – based partly on pathological, partly on animal experiment data. He highlighted that Semmelweis, with his prophylaxis managed to reduce the rate of fatal cases of puerperal fever after birth at the Viennese clinic from 10% to 0.1%.

Following his return to Hungary he achieved similar results at the obstetrics department of the Szent Rókus Public Hospital, and later at the obstetrics clinic of the Pest University Faculty of Medicine operating under his direction. He was revered in his homeland as a lifesaver. In his analysis Markusovszky – placing great emphasis on his words – highlighted: Professor Semmelweis made his discovery (1847) when certain scientific achievements were not yet known. The reader is convinced that at the time of his analysis (1861 vs. the 1880s), Markusovszky was referring to the discoveries made by Pasteur. That is, the priority, message, significance of Semmelweis' discovery is unquestionable.

After this Markusovszky closed his analysis with a description of the “gratitude” extended to the discovery. I quote: “But the gratitude with which at least some of the obstetricians received the discovery was also in line with the dominant views. This is a common fate of discoverers and discoveries. People normally love and exalt those who are capable of fighting in an adept and felicitous manner, to protect, and to show in new attractive light their favourite beliefs or prejudices; the one who dares to revolt against public opinion – even though it may be the opinion of scientists -, and to shake a century-old belief is a rebel, who, if cannot be defeated by reason, must be rejected by power and destroyed – this is what happened to our author.” “Numerous renowned obstetricians and scientists” – continued Markusovszky – “could not or would not accept Semmelweis' much simpler and natural discovery, probably due to the prevailing academic doctrines”. Let us also mention the Vienna school. Apart from a few outstanding personalities - Skoda, Rokitansky, Chiari – the ideas of the “rebel” Semmelweis were not accepted. It may be noted just as a “matter of interest” that opposition to Semmelweis' ideas was the strongest during the rectorship of Professor Rosas, an ophthalmologist born in Pécs.

Markusovszky's summary needs nothing added. Semmelweis' discovery had only challengers, but the significance of his discovery was indisputable and remains so.

Despite all this, Semmelweis – following an incurable illness manifesting towards the end of his life – died in unworthy and tragic circumstances. Indeed, it was written that Semmelweis' discovery had been forgotten. This forgettance however cannot be classified exclusively as a malicious error. To understand this, we must recall a professionally sound event series. This event series can be followed through an extremely interesting presentation by Benedek Varga, based on detailed analyses, which was held in 2000 at the Hungarian-German symposium on medical history at the Robert Koch Medical History Institute in Stuttgart. The author stressed (and confirmed in detail) that the change (namely forgettance, then from forgettance to the Semmelweis myth) was essentially related to the transformation of scientific historical thinking. Namely: the transformation can be linked to the phenomenon which “tries to present scientific thinking as not just an incessant, simply linear development, but rather as a set of confrontational discourses, .... placing more emphasis on the spiritual and intellectual milieu of an era, the environment and context in which a discovery is made.” Along this one might say, golden rule, misstatements can temporarily gain ground. This is what happened in Semmelweis' case. A flawed critical standpoint came to the fore which did not consider that with the work of Pasteur, Koch, Lister, a new medical professional paradigm system was created (a paradigm shift took place). This flawed critic concluded that Semmelweis did not discover

anything. A series of scientific works (in the end naturally) confirmed the significance of Semmelweis' discovery, however, in the meantime two decades had passed. Then – 20 years later – Semmelweis was reburied<sup>4</sup> and an international collection was organized to erect his public statue. Many donated, especially in England led by Sir Joseph Lister. Late posterity paid tribute to the medical scientist who was ahead of his time.

The development of the Semmelweis myth however is linked to the view and activities of Baron József Eötvös as Minister of Culture, the medical education modernized by Lajos Markusovszky who worked beside him, as well as with the significant development of the University of Pest, Faculty of Medicine, and with the successful international presence of Hungarian physicians. In his presentation Benedek Varga highlighted: one of the biggest successes in 1885 was the National Public Health Demography Congress held in Pest. Knowing that Lajos Markusovszky was the number one ideological and practical organizer of the congress, this does not come as a surprise to anyone among those working for the health of the “public”. It is also not surprising that in this period numerous Hungarian physicians conducted successful researches, with such internationally known and respected professors of medicine growing up as József Fodor a potential Nobel Prize candidate. The prestige of the Hungarian medical community grew. Whether this required a Hungarian “doctor-myth” as Benedek Varga puts it, or whether it was “simply” that unique personalities with internationally outstanding achievements for the health of the “public” such as Semmelweis, Markusovszky, Fodor and many others passed on the “baton” to each other that through this willingly or unwillingly their scientific achievements founded the birth of the myth which then just had to be given form. I believe that these two assumptions were at least of equal magnitude. Naturally, preparations had to be made “even” for the “giving it form” which the scientific leaders of the time did in an impressively elegant manner impacting the medical community of the entire world. The “crowning moment” of the process was the unveiling of Semmelweis' statue, during which, to borrow Benedek Varga's words, the mythical shell designed around Semmelweis became complete and which is well characterized by this quote taken from Dr. Vilmos Tauffer's speech at the unveiling in 1906: “Spirit of Semmelweis! Look down upon us at this moment. See here, the doctors of the whole educated world are extending you compensation for your sufferings and laurel for your immortal great discovery. See here around you the representatives of the best of your nation, who are grateful to you for the glory you have brought to your country and nation.”

If I may briefly finish my tribute with series of thoughts that on the one hand relate to the Semmelweis myth (1), with Semmelweis the individual and doctor-personality (2), the research method of the saviour of mothers (3). On the other hand, I would like to close by – using precisely the example of Semmelweis' life and fate as a starting point – remembering Hungarian “traditions”, customs of praising, recognition affecting many of the Hungarian personalities of science who had ascended to the same heights as Semmelweis.

---

<sup>4</sup> *Semmelweis was buried for the first time in Vienna*

1. I believe that the Semmelweis myth has been created. It would hardly exist if it was built exclusively on artificially “devised” elements. Of course, we naturally cannot speak of myth in terms of the original meaning of the word. We can however speak of a human accomplishment that was unparalleled in its time, its effect, example is eternal.
2. I further believe that considering the previous paragraph we can especially regret – as previously mentioned – that very few or no manuscript from Semmelweis survived. The image of a lone wolf, then a tragic lonely genius emerges from the printed material. However, Semmelweis’ discovery naturally does not equal Semmelweis since his discovery was of epic significance. I believe it important however to recall the human characteristics – the barely known personality – of the saviour of mothers. Semmelweis completed his education earning almost always excellent grades. He gained higher education in multiple fields. It is also important to know that he expected the same precision and perseverance from others that he expected of himself. The precise in his work, exemplary, demanding leader is really a true, respectable man. The fact that – unlike the majority of the professors of the time – Semmelweis wrote a textbook shows that he served his occupation, his “post” with humility and striving for excellence, he was a precise and efficient worker even as a professor. All of this is not contrary to Markusovszky’s analysis according to which, like every person fully aware of the substantiation, value of their achievements he gave precise but tough responses to those challenging his discovery with invalid arguments regardless of their position or fame.
3. Little is said in the “Semmelweis bibliography” about the methodology of Semmelweis’ discovery. It is true and natural that Semmelweis used mainly the known method of his time, primarily relying on his observation capability based on his outstanding abilities. However, we cannot not notice the interdisciplinary characteristic of Semmelweis’ research method: this interdisciplinarity became a characteristic of research influencing the 20<sup>th</sup> century (atomic age, computerisation, space exploration). I believe that Semmelweis’ interdisciplinarity was conscious (even if it primarily represented the different subdisciplines of medicine – obstetrics, epidemiology, pathology, hygiene, statistics, to which the philosophical knowledge he previously acquired is also linked). Based on the above I find it proven that with his method based on conscious interdisciplinarity Semmelweis was ahead of his age, just as he was with his medical discovery of historical significance.

Last but not least, I believe it is important to also draw attention to an eternal lesson stemming from the life, fate of Semmelweis. Namely: let us be the number one supporters of our physicians of exceptional ability and achievements or researchers, scientists working in other areas of science as soon as their talents become evident, when their internationally significant achievements unfold, but at least upon the recognition of their global achievements, let us promote the significance of their work and let us protect them from ignoble attacks or ignorance (conspiracy of silence). Of course, the feasibility of this depends on not just Hungary but also the global historical influences. We know that many of our intellectual giants were chased away from Hungary by death threats. But we also know that almost all of them grew up in the school system (by József and Lóránd Eötvös) that elevated the success of Hungarian scientific life to world level, and they remained Hungarians in their heart, soul, and even their language until

the end of their lives. They contributed decisively to the dismantling of the dictatorships that chased them away with their scientific work of outstanding importance and impact. The Hungarian population often could not even be aware of all this because the next dictatorship taking over Hungary demanded that their achievements be kept in the dark and that they not even be mentioned in the education system.

Let us beware! Semmelweis' name, inscribed in global scientific history, his life that ended tragically, compels the Hungarian nation to compensate him, at least post factum, for the above inhumanity, wrongdoings, him being stripped of his outstanding scientific achievements.

Hungary reborn by the regime change of course cannot make the past undone, but she can and will be able in the future to recognize our greats who influenced world history and who managed to live to see the birth of the free Hungary with the highest national honours. The intellectual giants who could not live to see the birth of the free Hungary should be commemorated in a manner that proclaims the need to heed the lesson from Semmelweis' story: our country will do everything so that the recognition of our sons with outstanding achievements shall proclaim worldwide the talent, humane thinking of the Hungarian nation, while at the same time telling the world that Hungary rightfully requires mandatory recognition due to those among the top in scientific rankings among nations.

## REFERENCES

Markusovszky, Lajos: Die Aetiologie, der Begriff und die Prophylaxis des Kindbettfiebers von J. Ph. Semmelweis. In: Markusovszky, György (arranged for publication.): Markusovszky Lajos válogatott munkái. Bp. 1905. pp. 279-292. Könyvismertetés. Orvosi Hetilap, 1861. No. 1, 12.14. (Selected Works of Lajos Markusovszky, Bp. 1905. pp. 279-292. Book Review. Medical Weekly, No. 1, 12.14.)

Antall, József- R. Harkó, Viola- Vida, Tivadar: Semmelweis Ignác (1818-1865) összegyűjtött kéziratái. Orvostörténeti Közlemények 46-47 (1968. pp. 185-267. (The Collected Manuscripts of Ignaz Semmelweis. Medical History Releases 46-47 (1968. pp. 185-267.)

Bruck, Jakab (1845-1902): Semmelweis Ignác Fülöp (1818-1865) és a gyermekági láz oka felderítésének kutatástörténete. 8 oldal nyomtatvány. (Ignaz Philipp Semmelweis (1818-1865) and the Research History of the Discovery of the Cause of Puerperal Fever. 8-page publication.)

Lesky, Erna: Semmelweis Ignác Fülöp (1818-1865) és a Bécsi Orvosi Iskola. 8 oldal nyomtatvány. Orvostörténet Közlemények 66-68 (1973) pp. 213-364. (Ignaz Philipp Semmelweis (1818-1865) and the Vienna Medical School. 8-page publication. Medical History Releases 66-68 (1973) pp. 213-364.)

Markusovszky, Lajos (1815-1893): Semmelweis Ignác (1818-1865) főműve a „Die Aetiologie (The Main Work of Ignaz Semmelweis (1818-1865), „Die Aetiologie)

Varga, Benedek: Egy mítosz születése. A Semmelweis doktrína és a Budapesti Királyi orvos-egyesület. A Robert Koch Orvostörténeti Intézetben rendezett magyar-német orvostörténeti szimpózium. Stuttgart. 2000. 10 oldal nyomtatvány. (The Birth of a Myth. The Semmelweis Doctrine and the Budapest Royal Medical Association. Hungarian-German Medical History Symposium Organized at the Robert Koch Medical History Institute in Stuttgart. 2000. 10-page publication.)

A Magyar Tudománytörténeti Intézet és a Semmelweis Orvostörténeti Múzeum, Könyvtár és Levéltár munkatársai (vezető: Gazda István, közreműködők: Kapronczay Károly és Szállási Árpád) által közreadott további, más Semmelweis dokumentumok. (Further Semmelweis documents published by the associates of the Institute for the History of Hungarian Sciences and the Semmelweis Medical History Museum, Library and Archives (led by István Gazda, contributors: Károly Kapronczay and Árpád Szállási))

Publications 1.-7. were digitalized by the associates (István Gazda, Károly Kapronczay and Árpád Szállási) Institute for the History of Hungarian Sciences and the Semmelweis Medical History Museum, Library and Archives. They are available in Hungarian language at: <http://mek.oszk.hu/05400/05427/>

Note: the citing of the data from the references is intentionally not in a uniform format. During their description we followed the forms used for the references of the articles published in different eras.

György Ungváry