SEMMELWEIS

His Life and Work

by

Gy. Gortvay
and
I. Zoltán

Akadémiai Kiadó Budapest

Semmelweis

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Semmelweis. Portrait in oil by A. Canzi (1857)

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Preface to the English edition

In the current year the 150th anniversary of the birth of Semmelweis is celebrated. An international conference has been convened by the Federation of Hungarian Medical Societies (MOTESZ) to commemorate this anniversary. The Board of the Federation has decided to publish our Semmelweis biography in English, to be presented to foreign colleagues attending the conference.

The English edition, being a translation of the original, Hungarian version, does not differ from it considerably. Nevertheless, I have made some slight alterations, as I could not refrain from introducing the latest results of research and scholarship both at home and abroad. Owing to the short time at my disposal the works of J. Antall, I. Benedek, E. Lesky, etc. could not be treated in detail; this had to be postponed to the forthcoming edition of this biography.

I have great pleasure in acknowledging the assistance of the historian Dr. J. Antall, deputy director of the Semmelweis Medical Museum, who—partly on basis of his own research—helped in the incorporation of recent findings.

It is very sad that my co-author and colleague, Dr. György Gortvay is no longer with us. Without his noble contribution this work could never have been completed. It is but a poor consolation that, though seriously ill, he still lived to see the first edition of our work come out of the press.

Budapest, 1968

Imre Zoltán

Preface to the Hungarian edition

Ignác Semmelweis has been called by posterity the "Saviour of Mothers". His discovery of the aetiology of the disastrous disease of his time, childbed or puerperal fever, makes him one of the most prominent figures of world medicine. The practical importance of his discovery lay in offering, at the same time, simple prophylactic methods.

Semmelweis came into the possession of the full truth both in theory and in practice, yet could not convince his sceptical contemporaries, although posterity, in command of new methods, has not been able to add anything to his discovery.

There is nothing strange about a searcher for truth finding many stumbling blocks in his way. It is also a historic fact that every great discovery has given rise to violent opposition, and in the majority of cases those in the forefront of authority were the first in their desire to wipe out and exterminate the new ideas.

Semmelweis was a lone and unperturbed fighter, defending his scientific views against a hostile world, insisting on the right of mothers to live. As professor of a second-rate university in a defeated and politically exploited country he continued to propagate humane ideas, and his optimism remained unshaken in face of hostility from academic quarters. His indomitable courage in standing up to opposition serves as a supreme lesson in the history of science and particularly in the medical profession. His life should be a reminder to all that every new doctrine arouses the hostility of those upholding obsolete views, which cannot be overcome by conviction and the fanaticism of the standard-bearer. Semmelweis had recognized early the social implications of scientific problems and remained undaunted in his fight against the forces of ultra-conservatism.

Let us be proud that Hungary gave mankind one of its greatest benefactors. Let us consider it our noble task to increase the recognition of Semmelweis both at home and abroad.

The purpose to bring out a new Hungarian Semmelweis biography is entirely justified considering that most of the full-dress biographies were written fifty years ago (A. Hegar, J. Bruck, F. Schürer von Waldheim, W. Sinclair). Our work intends to be a complete and documented biography, based on up-to-date research as well as on the vast Semmelweis literature. Relying only on documented facts and never deviating from the objective truth, we have been able to reveal the historic background of a great discovery, the life of a great scientist, and the relationship between Semmelweis and Lister. We have confronted contemporary evidence with recent research and have reconstructed the last years and months of Semmelweis's life with regard to his supposed mental illness. We are able to state that, excepting the few weeks before his death, he was perfectly normal.

It is true that he could not remain unaffected by the excruciating struggle for the recognition of his teachings, but the belief often repeated that his now classic work was written by a man with a deranged mind, has been proved completely unfounded.

We have been able to discover documented facts to prove that his teachings were not altogether disregarded by his contemporaries. It is an established fact that, due to the influence of Semmelweis, from 1858 onward, i.e. much before either Pasteur or Lister, the Surgical Clinic of Budapest University expected its staff to practise the chlorine handwash in their daily routine work. From 1862 onwards again it was made compulsory by the Hungarian administration of the Buda province that all hospitals under its auspices adopt the Semmelweis obstetric prophylaxis. This is at the same time the first instance in the world of official provisions for the prevention of childbed fever.

Each chapter in the book is followed by copious notes and commentaries providing information, facts and data. Many of the dates and facts referring to the life of Semmelweis in the world literature are incorrect. We have referred to them in various instances. Emendation and correct data can be found in the chronological table of the Appendix.

No Semmelweis biography can consider itself authoritative without special reference to the medical historian Tibor Győry, who is responsible for collecting and editing the complete works of Semmelweis, for defending him against unjustified priority claims, for introducing his name and his revolutionary discovery into international science, and last but not least, for making it clear that Semmelweis and his work belong to the Hungarians.

In our book we have endeavoured to call to life the noble stature of the great Hungarian scholar and to present the truth of his teachings and the historic greatness of his heritage. We wish to bring home to the reader the lessons of the life of this great man from the distance of a hundred years, fervently hoping that his tragedy will not be repeated in the history of mankind.

Budapest, 1965

György Gortvay
Imre Zoltán

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Chapter One

Background. Student-Years

The Semmelweis family — Hungarization of the family name — Childhood and school-years — University-years in Vienna and Pest — The faculty of medicine at the Vienna University. The professors — The faculty of medicine in Pest University. The professors — Doctor's degree is conferred on Semmelweis

The Semmelweis Family

Ignác Fülöp Semmelweis was born in Tabán, the oldest part of Hungary's then capital, the "free, royal city" of Buda, on July 1st, 1818. He was the fifth child of a German speaking bourgeois family.

We can trace the history of the family—with mention of the family name—back to the sixteenth century. The Semmelweises lived in small villages of county Sopron (Márczfalva—Marz, Szikra—Sieggraben, Kabold—Kobersdorf, Felsőpéterfa—Oberpetersdorf and Kismarton—Eisenstadt), which were then part of Hungary and were annexed to Austria after the first world war. They originated from a region populated by a tribe called Hintz (German: Heanzen, Hungarian: hienc), quite different from the rest of the German-speaking population of the country. The Hintz tribe had lived in Hungary from the time of the Hungarian Conquest in the tenth century and are believed to be the descendants of Charles the Great's Franks, who, in spite of the Austro-Bavarian germanization tendencies, had not lost their original racial characteristics. This nomadic tribe had given Hungary tradesmen and skilled artisans.

In the parish register of Márczfalva the name of Merth Semmelweis, vinedresser, was recorded in 1570. We can find the name of János Semmelweis a few years later, in 1586. In the following century the Semmelweis name occurs in the register of Szikra as owners of house property; in 1667 it is also recorded in the feudal estate of Kabold. At the end of the seventeenth century, in 1682 the name János Semmelweis, a master-blacksmith, occurs again. Our information, however, is very scanty owing to the fact that many records of the past have been destroyed. But from the end of the seventeenth century onwards, the family history can be traced without interruption. György Semmelweis (1670–1723), farmer at Szikra, was married in 1692, and his sons moved to the village of Kismarton. One of these, another János Semmelweis, married Terézia Gschaider, and their son János Péter, a vineyard-hand, was to become the grandfather of the great obstetrician. The Semmelweis family continued to live in Kismarton [1].

The history of the family begins in Buda on November 21st, 1806, when József Semmelweis (1778–1846), father of Ignác, born at Kismarton, moved to Buda and became a 'citizen of Buda'. Tabán, Semmelweis's birthplace, and the scene

of his young days, had played an important part in the life of the city—bridgehead to the Danube's only boat-bridge, it was an important crossing point and a lively, busy, trading and commercial centre [2].

In the nineteenth century Tabán was the home of many nationalities. This originally pure Hungarian settlement had given from the sixteenth century onwards refuge to Roman Catholic Bosnians and Dalmatians, called by the Latin name of Illyrians, and also to Orthodox Serbians (Rácz), after whom Tabán received its second name: *Rácváros* (Rácz-town).

During the hundred and fifty years of Turkish domination the town became impoverished, with a population seriously reduced in number. After the expulsion of the Turks, at the end of the seventeenth century, the Court in Vienna made provisions for the systematic inflow of German settlers to Buda and its vicinity. In the time of Semmelweis the city of Buda was mainly inhabited by Hungarians and Germans engaged in trade and commerce, and also by Serbians, whose number considerably diminished by the first half of the nineteenth century.

At the beginning of the nineteenth century Buda was no longer exclusively the focus of trade and commerce: the capital of Hungary was gradually developing into a political and social centre. In 1723 the high court of justice, the *curia*, was removed from Pozsony (Presburg) to Pest, and in 1777 to Buda, whereas in 1784 also the university of Nagyszombat moved to Pest. These circumstances considerably enhanced the importance of Buda and Pest as centres of political and intellectual life.



Semmelweis's birthplace (an old photograph)

At the time of the birth of Semmelweis also Hungary suffered from the recession caused by the Napoleonic Wars. After the 1825–27 sessions of the National Assembly a new glorious age—the Reform Age—began to unfold in Hungarian history. The slogans of the period, Hungarian national culture and national independence had been tremendous incentives. The spirit of nationalism was strong in this period which produced men like Vörösmarty, Petőfi, Arany, Jókai, Erkel, Eötvös, Kossuth, Széchenyi, Jedlik, and so many others. The desire for independence flared up in all ranks of society and its champions feverishly endeavoured to make up for the omission of the past.



The memorial plaque placed in 1906 on the house where Semmelweis was born

The early years of Semmelweis's life coincided with a period when the idea of change in the political and social structure of the country had captivated all people, and when patriotic fervour was the common note in behaviour. Tabán, the busy commercial centre had shifted into the focus of social movements. It was in these years of the Reform Age that Pest and Buda which, owing to the preponderance of the German and Serbian elements, had very nearly lost their Hungarian character, regained it both in spirit and language. There is little doubt that the new poets and writers were mainly responsible for this, the more so as the protagonists of the Reform Age, the young intellectuals, looked upon the representatives of the new literary trends as their leaders. Opposite the house where Semmelweis was born lived the highly respected poet, Benedek Virág (1754–1830), former Pauline monk and historian, whose house became a veritable Mecca of writers and of their disciples, the young intellectuals [3].

No wonder that many biographers came completely under the spell of the district where the birthplace of Semmelweis was situated. The house, underneath the Royal Palace, became haunted in their imagination, and they believed that it head harboured a medieval monastery, a Turkish harem, or at least a *tsarda*. Reality, on the other hand, was less romantic: Apród Street, where the house was built, was in fact of medieval origin but its old houses had been destroyed



Modern view of Semmelweis's birthplace

in the fights when Buda was recaptured in 1686. Its northern side where the Semmelweis house was erected had not been built up before the last decades of the eighteenth century.

The Semmelweis house, Apród Street 1–3, was also built at about that time, in Baroque style. In the land-register of Tabán the house was entered under the name of János Meindl, as item 982 (later 932 and 628) and was not owned by the Semmelweis family. József Semmelweis's grocery store to "The White Elephant" (*Material, Spezerey und Farbwaren*) stood here between 1806 and 1823. The house had changed considerably inbetween. The great fire of 1810 badly damaged the whole district and also the Meindl house suffered severely. It was soon rebuilt, however, and the one-storey house with thirteen windows was given its present 'zopf' façade [4]. József Semmelweis lived in this house. At the age of 32, on January 14th, 1810 he married Terézia Müller (1790–1844) in the Parish Church of the Krisztinaváros district. She was the daughter of a Bavarian immigrant, Fülöp Müller (1760–1841), a well-to-do coach-wright (*rotarius*) who obtained citizen-rights on October 31st, 1791. It was only later, in 1823, that the family moved to the opposite side of the street, to the house bought in 1822, into which the shop of Semmelweis's father was also moved [5]. Apart from this house, the Semmelweis family owned three more houses, proving their affluence, enhanced also by the alliance with the Müller family [6]. Thus it is not surprising that József Semmelweis was made chairman (*Obervorsteher*) of Grocers' Association.

The children listed in Tibor Győry's genealogical table as being descended from József Semmelweis and Terézia Müller are not identical with the actual children of the same. The number of children was not seven but ten, and Ignác was not the fourth but the fifth child of his parents. There are other false particulars in Győry's genealogical tree. Ignác Semmelweis was married Vto Mária eidenhoffer on July 1st and not, as wrongly quoted, on June 7th. Ignác died on October 16th and not on October 15th; Mária was born November 2nd, not on 20th and died March 16th, and not March 15th; Margit was born May 8th, and not 10th, and was christened on May 16th; Béla was born November 20th, and not 22nd.

The children of József Semmelweis and Terézia Müller were the following:

1. József Zemelveiss, born March 14th, 1812, Buda–Tabán. Citizen of Pest June 27th, 1842. Died March 29th, 1860, Pest–City.
2. Károly Fülöp Zemelveisz, born Jan. 9th, 1813, Buda–Tabán.
3. Fülöp Alajos Szemelveis, born April 4th, 1814, Buda–Tabán.
4. Julianna Anna Terézia Szemelveisz, born Sept. 13th, 1815, Buda–Tabán. Married Péter Ráth, May 28th, 1836, Buda–Tabán
5. Ignác Semelvais, born July 1st, 1818, Buda–Tabán
6. János Bapt. Semelveis, born June 2nd, 1820, Buda–Tabán
7. Ágoston Semelvais, born July 4th, 1821, Buda–Tabán
8. Alojzia Semelvais, born June 10th, 1823, Buda–Tabán
9. Mária Terézia Semelvaisz, born Jan. 18th, 1827, Buda–Tabán
10. Stillborn male child, born Aug. 5th, 1832, Buda–Tabán.

The corrected genealogical table of the Semmelweis family follows below (p. 16). The spelling of the family name follows the original documents [7].

The eldest son, József (1811–1860), was granted citizen-rights on June 27th, 1842 in Pest and continued as a grocer according to family tradition [8]. Fülöp also became a tradesman, and the third brother, Károly, was a Roman Catholic priest [9]. The sister, Julianna, married in 1836 Péter Ráth, a pharmacist of Buda, who inherited the chemist shop of his father, József Ráth (d. 1836) [10].

The mother of Ignác Semmelweis died March 26th, 1844 and her death broke up the family circle. After his wife's death the father's health deteriorated and he died after two years' ailment on July 11th, 1846, at the age of seventy.

Hungarization of the Family Name

For the sake of completion it should be mentioned that many members of the Semmelweis family, amongst them the widow of Semmelweis herself, changed their names to Szemerényi.

Károly Semmelweis, chaplain in the City Parish Church of Pest, was the first to adopt the name of Szemerényi in 1844 (by authorization of the Imperial



Semmelweis's parents, Terézia Müller and József Semmelweis

Chancery, No. 16.558/1844). He was followed by his brother Fülöp in 1849 (Imp. Chanc. No. 349.365/1849). On November 19th, 1879, the widow of Ignác Semmelweis applied in her own name and in that of her three minor children (Margit, Béla and Antónia) to be permitted to use the name of Szemerényi. It was granted by an authorization of the Minister of the Interior, No. 4684/1879. The widow of Semmelweis was henceforth to use the name of Mária Szemerényi [11].

It is natural that Semmelweis's widow was asked what reasons prompted her to change her name. In 1906 she gave the following explanation: "The question is extremely disturbing to me. Many people are puzzled at my having discarded the great name of my husband, and I cannot deny that they may be right. I have only one excuse. When I changed my name to Szemerényi, I was led by patriotic feelings, and when I made the decision there was nobody to warn me against it. I have often thought since to apply again for permission to use my husband's great name, but I was afraid that it might be interpreted as an act of vanity. I am greatly relieved, however, to know that the whole world is sympathetic and will remember his name for ever and ever" [12].

Some of the Semmelweis biographers believe that Semmelweis himself may have used the name of Szemerényi, having asked for the authorization [13]. This is not so. The name Semmelweis figures in all testimonials, in his birth and marriage certificates, in his diploma, in his death certificate. He always signed his name as Semmelweis in all documents. His widow's application for a change

First wife: *Kunigunda*
m. Sept. 16, 1692

Second wife: *Mária Anna*
m. ?

Gertrud b. 1695 — *András* b. 1696 — *Anna Erzsébet* b. 1698 — *Éva Borbála* b. 1706

József
b. ?
m. Mrs. *Anna Reiter*
Jan. 11, 1739
Kis-Marton

Erzsébet
b. 1711 (1713?)

János
b. ?
m. *Anna Gschaider*
Nov. 21, 1746

Mária Anna
b. Dec. 12, 1741

József
b. Oct. 12, 1744
m. *Mária Anna*

József b. March 3, 1772 — *Gáspár* b. Oct. 28, 1776 — *János* b. Nov. 23, 1783

János Péter
b. Oct. 19, 1751
m. *Anna Lidl*
1776

József
b. Febr. 21, 1754
d. 1755

József
b. Dec. 31, 1759

József
b. Jan. 30, 1778
m. *Terézia Müller*
1810, Buda

Lipót
b. Febr. 1, 1780

Juliánna
b. 1782

Bertalan
b. June 21, 1788
m. *Rozália Held*

József — *Károly* — *Fülöp* — **Ignác**
b. July 1, 1818
Buda
m. *Mária Weidenhofer*
June 7, 1857
d. Aug. 13, 1865
— *János* — *Ágoston* — *Júlia*
m. *Péter Ráth*

Ignác
b. Oct. 14, 1858
d. Oct. 15, 1858

Mária
b. Nov. 20, 1859
d. March 15, 1860

Margit
b. May 10, 1861

Béla
b. Nov. 22, 1862
d. Sept. 14, 1885

Antónia
b. July 26, 1864
m. *Kálmán Lehoczky*
Nov. 4, 1882

Márta
b. Aug. 2, 1883

Andor
Lehoczky-Semmelweis
b. Jan. 22, 1885

Béla
b. Apr. 27, 1887
d. Febr. 8, 1888

Kálmán
Lehoczky-Semmelweis
b. Sept. 5, 1889

Mária Antónia
b. Febr. 9, 1894

The Semmelweis Family Tree
(after Győry)

József Semelweis and
m. 14. 1. 1810
József Semmelvaisz
d. 13. 7. 1846

1.	2.	3.	4.	5.
József Zemelveiss 14. 2. 1811	Károly Fülöp Zemelveisz 9. 1. 1813 1844: "Szemerényi"	Fülöp Alajos Szemelweisz 4. 4. 1814 1849: "Szemerényi"	Julianna Anna Terézia Szemelveis 13. 9. 1815 m. Péter Ráth 28. 5. 1836	*Ignác* *Semelvais* 1. 7. 1818

Children: 1.

Genealogical Table of the
(Compiled from original registers in Buda,

of name is the best proof, for had this been done by her husband, there would have been no need for her to apply.

Childhood and School-years

We know little about his childhood. He hardly ever refers to his early days in his writings. Contemporaries, however, remember that his was a happy, united family, the many children sharing the loving care that held them together. In the content family circle he developed into an industrious and honest boy, these qualities accompanying him throughout his life. He was known as an obedient, intelligent child, extremely fond of animals. In his later years he continued to be fond of pets, always keeping cats and dogs about the house.

Practically nothing has come down to us about his elementary schooling, but we know a good deal about his secondary studies. He was a hard-working, industrious student.

Ignác and his brothers attended the Catholic Gymnasium up in the Castle Hill. The school was opened by the Jesuits in 1687, and instruction started 15

Teréz Müller

Teréz Semmelveisz b. Müller
d. 26. 3. 1844

---

6. Bapt. János Semelveis 1. 6. 1820

7. Ágoston Semelvais 4. 7. 1821

8. Alojzia Semelvais 10. 6. 1823

9. Mária Terézia Semelvaisz 18. 1. 1827

10. József Semelvais "Partus Mortuus" 25. 8. 1832

28. 2. 1825: Ignác, Vaidenhofer, Körmend, citizen of Pest
23. 12. 1837: Mária Eleonóra Antónia Franciska Veidenhofer

Ignác Szemmelweisz and Mária Windenhoffer
m. 1. 6. 1857 1879: "Mrs. Ignác Szemerényi"

---

2. Mária Gabriella Antónia Szemmelveisz

22. 11. 1859

3. Margit Antónia Adél Semmelweis

8. 5. 1861

1879: "Szemerényi"

4. Béla Antal Ignác Semmelweis

20. 2. 1862

1879: "Szemerényi"

5. Antónia, Mária, Auguszta, Anna Márta Semelweisz

26. 7. 1864

1879: "Szemerényi"

Ignác Szemmelveisz
d. 16. 10. 1858

Mária Szemmelweisz
d. 16. 3. 1860

Béla Szemerényi
d. suicide
14. 9. 1885

Antónia Szemerényi
aged: 18
m. Kálmán Lehoczky,
44 years old
4. 11. 1882

Semmelweis Family
Pest and Budapest by Dr. Béla Szalay)

months after the recapture of Buda from the Turks. When Pope Clement XIV dissolved the Jesuit order, the school became a secular institution, called Royal Catholic Super-gymnasium *(archigymnasium)*. In 1777, under *Ratio Educationis* it received the title of Royal University Supergymnasium.

Between 1832 and 1951 the school was handed over to the Piarist order. At the age of eleven, in the school-year of 1829–30, Ignác Semmelweis began his studies in the first form, before the Piarists had taken over the school. In the first year he was among the best students, occupying the fifth place and in Hungarian language and literature the eighth place. He continued to get better marks, and even in Hungarian he was always among the best.

We feel that it is important to dwell upon this fact, as the trading population of Buda and Pest were German-speaking, at least the majority, the Semmelweis family being no exception. Most of the inhabitants could speak also Hungarian with fluency, but the language in the family and in business was a dialectal form of German, the Buda Swabian.

Although the teaching of Hungarian in secondary schools had been compulsory since 1792, it was still quite inadequate as compared with German and Latin.



Semelweis Jósef, Károl, Fülöp, Ignácz, János, Agoston, és Julia özvegy Ráth Péternő mogy. és Teréz, Jósef, Péter, Károl gyermekei nevében keseredett szívvel jelentik feledhetlen szerető édes attyunknak, illetőleg nagyattyunknak

SEMELWEIS JÓZSEF

úrnak

polgári kereskedőnek két évi súlyos betegeskedése következtében a' haldoklók szentségeinek áldásos felvétele után folyó évi nyárhó 11-dikén estve 9-edfél órakor, életének 70-dik évében történt gyászos kimultát.

A' boldogultnak hideg tetemei a' tabon nemzetségi sírboltba folyó hó 13-án 7-edfél órakor estve örök nyugalomra tétetni, a' holotti gyászmisék pedig a' következő napon a' tolnai anyaegyházban 10 órakor fognak tartatni.

Budán, nyárhó 12-kén 1846.

Obituary notice of Semmelweis's father

Latinist rhetorico-legal learning was the ideal of the cultured classes even in the 1820s. By the time they had left school only a few had learned to write, read and speak Hungarian correctly. It should not be forgotten, however, that the Piarists had done their level best in their schools in an effort to emphasize the study of Hungarian. Therefore, it is no doubt mainly due to them that Semmelweis had mastered Hungarian speaking as well as writing, professing himself a Hungarian and considering Hungarian his mother-tongue.

Semmelweis attended the first three, so-called, grammarian classes, but his name does not figure among the students of form IV, in the school-year of 1832–33. He must have moved to some other school that year, perhaps somewhere in the provinces. But this is only guesswork, as no information seems to be available.

For the humanist classes I and II (forms V and VI), in the school-years 1833–34 and 1834–35, he was back again in the Gymnasium of Buda. Thus from the six secondary school classes he attended five at Buda. His best scholastic results were achieved in the last year. He passed his final exams in July 1835, finishing as a top student, achieving the distinction of *secundus eminens*, competing with the best, *primi aemulus*.

The historian Gyula Szalay makes the following remark about the scholastic results of Semmelweis: "Ignác attended the second humanist class

in 1835, corresponding to the sixth gymnasium form, his final school certificate marks him as eminent. As to his nationality, Ignác Semmelweis professed to be *Hungarus*, being also among the first in his Hungarian studies" [14]. Szalay's statement is confirmed by copies of the original school certificates for the school-years 1829–30 and 1834–35, preserved in the Library of the Medical University of Budapest.

It should be emphasized that in the year-books of the school (*Informationes*), the nationality of both Ignác and his brothers is marked as Hungarian. He figures as *Hungarus*, whereas the nationality of the non-Hungarians was marked as *Germanus*, *Austriacus*, *Croatus*, etc.



Portrait of Semmelweis as a child

The two top classes of the secondary school of today were in those times Courses in Philosophy held at the university and at various academies. The schedule contained lectures on philosophy, logic, history and natural history. It was compulsory to attend the courses for pupils who wished to go on to the universities [15]. There is no information available as to where Semmelweis attended the courses. We only know that he began his university studies, corresponding to the two-year schedule in the autumn of 1837.

University-years in Vienna and Pest

After his secondary-school studies Semmelweis had to decide what further course to take. His father insisted that he should study law and become a military judge. This was entirely in keeping with the cultural and social conditions of the day, the bourgeoisie being mainly keen on legal studies. At the time, and for a long time after, a legal degree entitled the holder to any position in public life. As a matter of fact, no other qualification offered the same chances, doubly true as far as social sciences and medicine were concerned.

Complying with his father's wishes, Semmelweis enrolled as a law student in the University of Vienna in the autumn of 1837. During the academic year 1837–38 he studied law, but the following year finds him already at the faculty of medicine.

We are not acquainted with the reasons which made him change his mind. Was it on the spur of the moment, or a feeling of the nobility of the doctor's

mission, or was it the influence of his friends, most of them medical students who had prevailed upon him? The question will have to remain open as no information has come down to us. Dr. Berres, Professor of Anatomy, lecturing in the first year course was extremely popular with the young students. It is not unlikely that this popularity may have influenced his decision [16].

At that time there were many Hungarian students at the medical faculty. It sometimes even happened that the number of Hungarian students reached that of the Austrians. The Hungarian Association had more members than any other students' club of the moment at the University of Vienna [17].

A certain Lajos Markusovszky also belonged to the Hungarian students' colony, in spite of the fact that he had taken his doctor's degree in August, 1844 at the University of Pest. Between 1845 and 1847 he had studied under Professor Wattmann in the surgical clinic. The friendship between Markusovszky and Semmelweis began at the time in Vienna and in 1846 the two young men were even sharing rooms in Vienna. After Markusovszky's return to Pest in 1847, they exchanged letters regularly. Another of his friends was Emil Schnirch, son of a Buda family, who has also studied with Semmelweis in the Gymnasium of Buda. He obtained his medical degree in Vienna in 1846, and continued to work for another four years in the State Mental Hospital of that city.

A further member of the Hungarian medical colony was Károly Kanka. He had worked between 1844 and 1848 as assistant to Professor Rosas, the ophthalmologist, who later played a considerable role in directing the fate of Semmelweis. Ignác Hirschler who was to be another of his intimate friends in the course of time also worked here as an unsalaried assistant in 1848. Ferenc Schwartzer (1818–1889) the founder of psychiatry in Hungary began his career here, too, studying under the Hungarian Mihály Viszánik (1792–1873), head of the mental department of the State Hospital. For a short time Semmelweis was together with Dávid Gruby, who left Vienna in 1840 after having obtained his doctor's degree in 1834. He worked in Wattmann's clinic and subsequently in the institute of Berres, engaged in microscopic studies and contributing to scientific journals.

János Bókay was another Hungarian medical student in Vienna, curiously, also starting as a law student at Sárospatak. An important member of the Hungarian colony was János Balassa. He had taken his doctor's degree in Pest in 1838, but had received a scholarship for 1830–40 to work in Wattmann's clinic. In 1841 he was appointed to the IVth surgical department of the State Hospital of Vienna. At the age of 28, in 1843, he was appointed to the chair of surgery in the University of Pest.

The Faculty of Medicine at the Vienna University. The Professors

Why did so many Hungarian students study in Vienna at a time when the University of Pest also had a medical faculty? The answer to this interesting question is that it was only possible to practise medicine in the Austro–Hungarian Monarchy

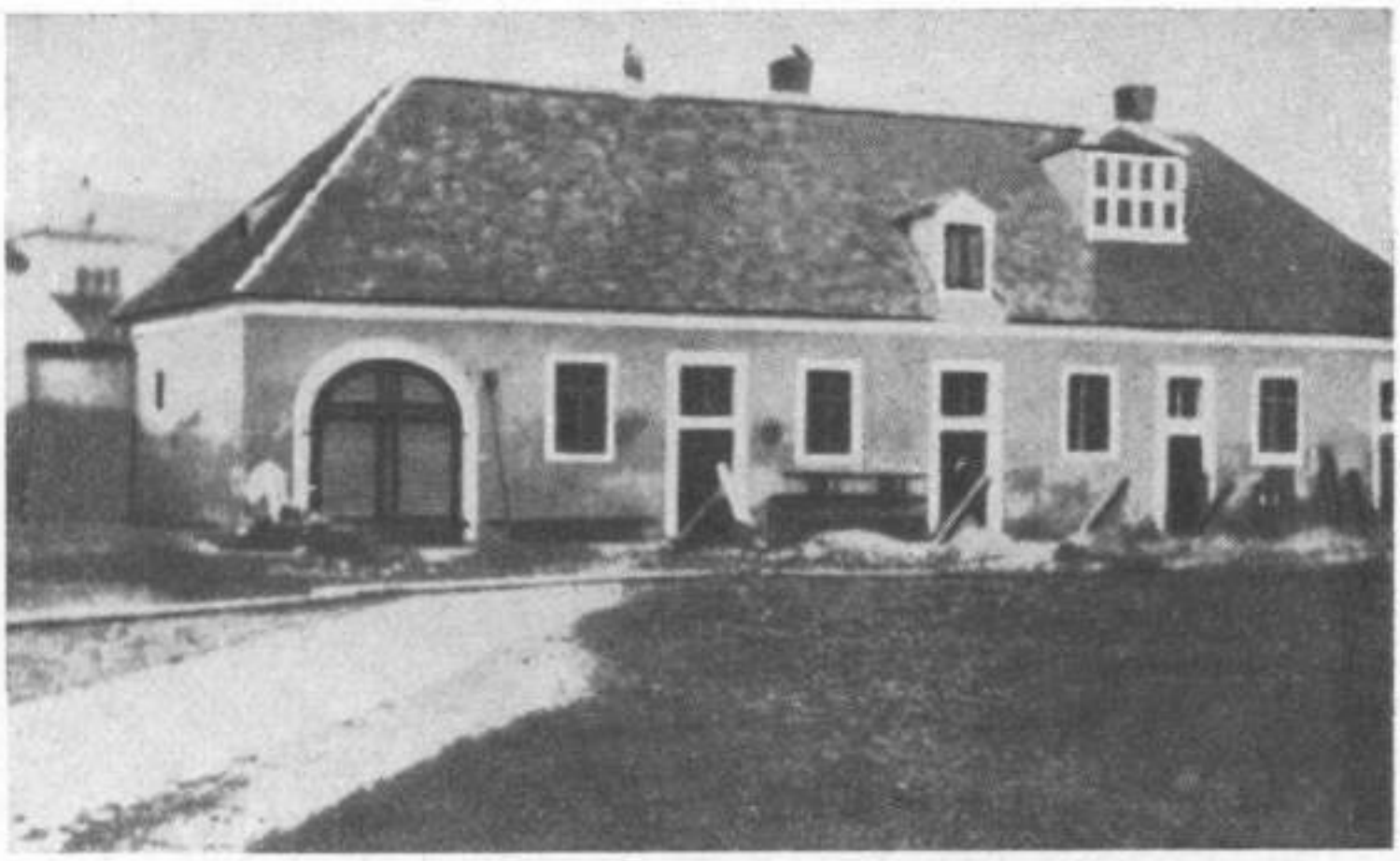
if in the possession of a degree issued in Vienna, whereas with a Pest or Prague degree the holder could only practise in the respective countries. Consequently a Vienna degree was more valuable than one issued by any other university in the Monarchy.

That, however, was only one of the reasons. Young men went to study in Vienna, especially from Hungary, because as regards the level of tuition, there was a great difference between the universities of Pest and Vienna.

In those days, Vienna was one of the centres of the political, social, cultural and scientific life of Europe. The fame and tradition of the medical school of Vienna had attracted, and not without reason, a considerable number of medical students and doctors from all over the world.

The Vienna school reached its full development in the second half of the eighteenth century. The greatest factor in its history, the anchor of its evolution was the General Hospital (*Allgemeines Krankenhaus*) of Vienna, which opened August 16th, 1784, transformed from an almshouse. The enormous hospital, with its great number of patients was most suitable both for teaching and for research, and also the university clinics operated within its framework. Soon it became a model institution for curing the sick as well as for training specialists. In the first half of the nineteenth century, however, the medical faculty of Vienna University was on the decline. The hospital was out-of-date with no laboratories, and the university lacked outstanding talent among its professors; the great Vienna school and its famous doctors (Anton van Haen, Auenbrugger, Störck, Stoll, Van Swieten) were only a memory. Also the level in the training of doctors and curing the sick had deteriorated considerably. For example, in the eighteen-thirties the method of auscultation was not yet known in the Vienna hospitals and clinics.

At the end of the eighteenth century France was the scene of the greatest historical event. By shaking off the shackles from scientific research, the great French bourgeois revolution inaugurated new intellectual trends which had a



The building housing the Institute for Pathological Anatomy in Vienna



Karl Rokitansky

tremendous impact on scientific development, especially in the field of the medical and natural sciences in all Europe, but most particularly in France.

It is evident that in the first decades of the nineteenth century French medical science towered over the rest of Europe, and French scientists became the champions of progress. New research in pathology gave a fresh impetus to physiological observations, and the French school of anatomy and physiology changed the whole of clinical medicine. The great heritage of Morgagni and Auenbrugger left to eighteenth century medicine had been developed to advantage by French physiologists and pathologists.

Forty years after Morgagni, F. X. Bichat (1771–1802), a pioneer of histological research, came to the conclusion in 1797 that pathological changes caused by diseases should not be investigated in the organs of the body but in the tissues. Opposing the animist and vitalist conceptions of the time, Bichat said "Observation is of little avail if we do not know the seat of the trouble", thus trying to discover the laws of life by pathological research [18]. One of the greatest French doctors of the time, R. T. H. Laennec, invented a new instrument to serve classical diagnostics by his method of mediate auscultation [19]. P. C. A. Louis (1787–1872) suggested the introduction of a statistical method to check the efficacy of the curing media. The register was to include serial observations, not merely data concerning single patients. He and his disciples had brought the situation to a point where in the early nineteenth century confidence in the traditional medicines was seriously shaken. French scientists had potently contributed to the development and progress of science. On the other hand, it seemed as if the German universities had come to a standstill, to which the University of Vienna was no exception.

In the first decades of the nineteenth century the chief representative of clinical medicine was W. R. Hufeland (1762–1836), professor at the University of Jena, later of Berlin. In his works he propagated the idea of a healthy way of life for the individual, but he rejected the most obvious diagnostic methods, such as auscultation and percussion, as unsatisfactory and threw in his lot with those who believed in the application of homeopathy [20].

The results achieved by the French school of medicine did not reach the Germans before the eighteen-twenties. In the following decades, pathological and experimental trends prevailed in medicine for which Vienna was an excellent centre, and in its course a new medical school began to flourish. Although the

main trend continued to be pathology, emphasis was no longer only on the description of pathological changes, but on the history of pathological processes and their correct interpretation.

When Semmelweis was a student at the University of Vienna nothing was as yet evident of the rise of the second great medical school except the doctors who would later be responsible for it, and they themselves were no more at the time than junior hospital staff members in subordinate posts.

K. A. Wunderlich (1815–1877), the celebrated physician of Leipzig, visited Vienna on his way back from Paris in 1840, when he was 26 years of age and still a docent in Tübingen. In a lecture that aroused considerable interest he compaired the medical institutions of the two cities, stressing that in Vienna he noticed signs of a revival similar to those he had experienced in Paris in the early decades of the century. He pointed out how much he admired the work of certain hospital doctors in junior posts, especially the efforts of Rokitansky [21].

After 1800 there had not been any outstanding professors to boast of in the medical faculty of Vienna. The great figures of the Vienna medical school, such as Rokitansky, Skoda and Hebra, had not yet risen to eminence. Pathological research started in 1796 when J. P. Frank instituted a post for a medical officer for pathological anatomy at the 2nd Medical Clinic in the General Hospital. Up to 1803 this was filled by A. R. Wetter (1764–1806). The position, however, remained vacant until 1812, when L. Biermeier was appointed to the Medical Clinic, then under Professor I. V. Hildebrand. It was only in 1821 that the Institute for Pathological Anatomy was opened and Biermeier was appointed Professor Extraordinary. He functioned as director of the institute until 1831. For a short time he was succeeded by J. Wagner, and in 1834 Rokitansky took over. Pathological anatomy had not developed very much as a science before him, nor had it been made a compulsory course for instruction at the university before 1844.

It is an old law of nature that no new doctrine can win before defeating the old one, and the supporters of the old doctrine do not easily give in. Nor is it a coincidence that most members of the medical faculty were deeply concerned at the appointment of Skoda, or that the same elements were responsible for frustrating Semmelweis both in his personal and public career. It is neither by chance that Semmelweis received assistance and encouragement from men like Rokitansky, Skoda and Hebra.

In the period we are discussing the following professors represented the medical faculty of Vienna University: V. Kern, as Professor of Surgery, opened a surgical institute for all the countries of the Monarchy in 1807. He was succeeded in 1824 by J. M. Wattmann (1789–1866), who continued in that capacity until 1848. In 1841 a second surgical department with 12 beds was established under F. Schuch (1801–1865). Between 1806 and 1818 J. V. Hildebrand (1763–1818) lectured on medicine (*Spezielle Pathologie und Therapie*), followed between 1818 and 1829 by J. N. Raymann (1780–1847); he again was succeeded in 1841 by W. Lippich (1799–1845).



Ignác Stáhly

The Hungarian Professor of Physiology, Mihály Lenhossék, was succeeded in 1825 by J. J. Czermák (1799–1850), followed in 1849 by E. Brücke (1819–1892). L. Kolletschka (1803–1847) lectured on forensic medicine, succeeded by J. Dlauhy (1807–1888) former Professor of Pathological Anatomy at Prague University. The Hungarian G. Carabelli (1787–1842) lectured after 1821 on dentistry in his capacity of *Privat-docent*.

A. Rosas (1791–1855), a man of Hungarian origin, was Professor of Ophthalmology and was also editor-in-chief of *Medizinische Jahrbücher* between 1841 and 1847. In obstetrics, the talented Professor Boer (1751–1835) was succeeded by J. Klein (1788–1856). Semmelweis himself worked under Klein, whose name would not have come down to posterity, had he not been responsible for checking the academic career of the famous Hungarian doctor.

The director of the Botanic Gardens, J. F. Freiherr von Jaquin (1766–1839), lectured on natural history, he was succeeded by a scientist born in Pozsony (to-day Bratislava) S. L. Endlicher (1804–1849). J. Berres (1796–1844) as Professor of Anatomy enjoyed tremendous popularity among his students. He was succeeded by J. Hyrtl (1811–1894), former Professor of Anatomy in Prague.

Medical history has not much to say in praise of the professors of the medical faculty. Brücke himself was not undistinguished and had acquired a reputation with his researches on the physiology of sense organs as well as of the muscular and nervous systems. Professor Berres had roused interest with his book: *Anatomia Microscopica Corporis Humani*, where woodcuts illustrated his histological researches and his microscopic technique is discussed at some length. Hyrtl's handbook: *Lehrbuch der Anatomie des Menschen* was brought out in 22 editions in the period ending in 1875.

Nevertheless there was one outstanding figure among the professors of the second medical school of Vienna: K. Rokitansky (1804–1878) who was appointed professor in 1844. He had worked in the Institute for Pathological Anatomy since 1832, and had become its director in 1834 as Professor Extraordinary. He had performed a yearly total of 3000 autopsies, recording his pathological observations and making them available to the students. He studied the pathological changes in the diseases, and tried to discover their causes. In 1853 Rokit-

ansky became rector of the University of Vienna. In 1863 he was appointed to the medical department of the Ministry of Public Education in Vienna and in 1869 was elected chairman of the Austrian Academy of Sciences [22].

Another distinguished member was J. Skoda (1805–1881), Professor of Medicine between 1846 and 1871. Previously he had worked as head of department in the General Hospital in a ward for "chest-patients", specially organized for him. His name was made famous by his work: *Abhandlung über Perkussion und Auskultation* (Wien, 1839), which came out in six editions in ten years and won world-recognition to its author. The stethoscope and its medical application were first described by F. Müller, the disciple of Laennec. In 1832 he delivered a lecture to the society of *Deutsche Naturforscher und Aerzte Versammlung* on the subject, without rousing much interest. The use of the stethoscope was only popularized by Skoda after the appearance of his book.



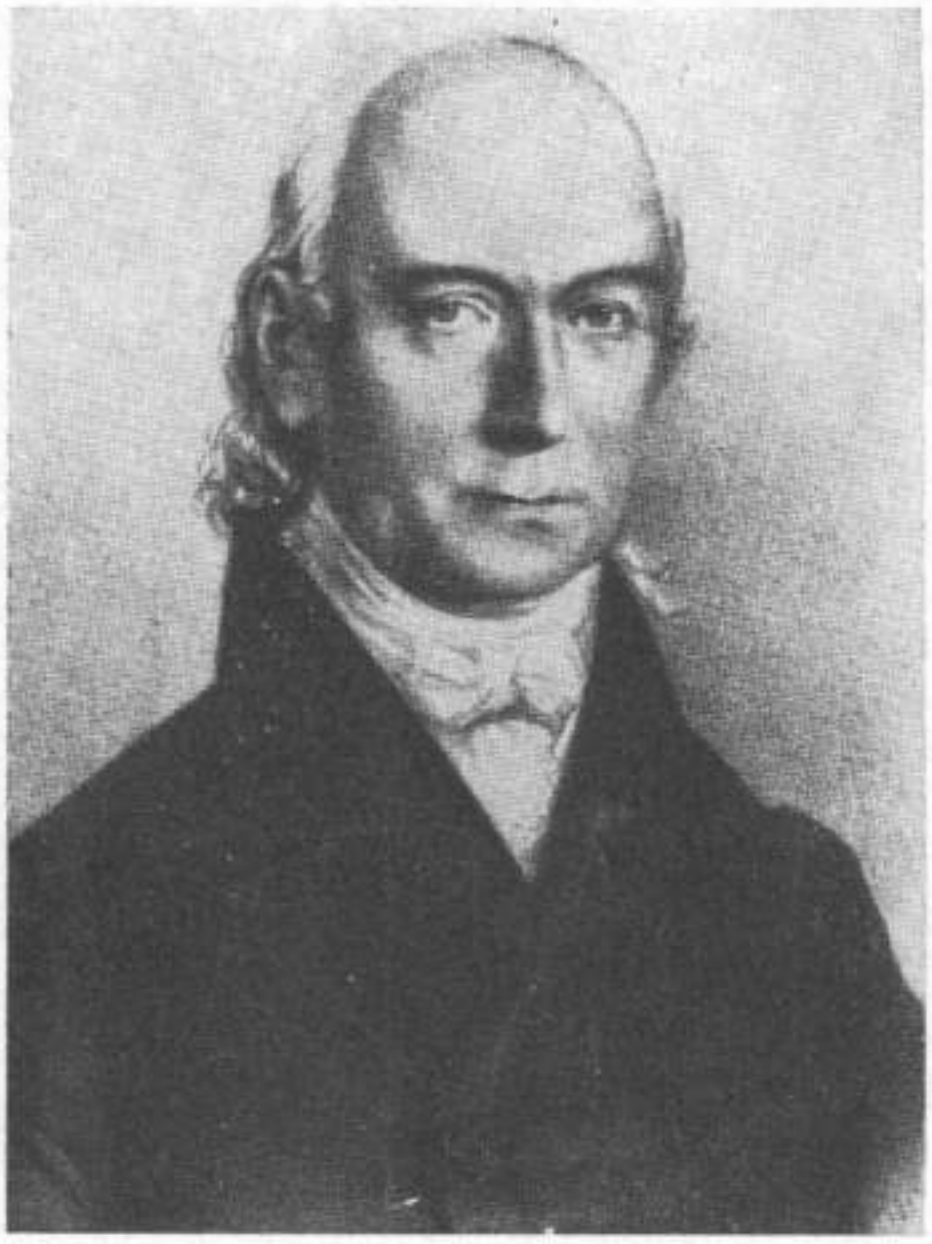
Teofil Fabinyi

Nevertheless when the chair for medicine became vacant in 1845 he was not designated, and his appointment as professor was only due to Rokitansky's intervention.

The third of the trio, F. Hebra began his career as assistant in Skoda's department which had a special "contagious" ward (*Ausschlagabteilung*). In 1842 he became first assistant, and in 1851 responsible also for the dermatological department. In 1858 he was appointed the head of the dermatological department, in 1859 Professor Extraordinary. Between 1869 and 1879 he functioned as the first Professor of Dermatology in the University of Vienna [23]. Professor Hebra's name has gone down to posterity for his work in the pathological classification of skin diseases.

The Faculty of Medicine in Pest University. The Professors

The reorganized medical faculty of the Royal Hungarian University *(Regia Scientiarum Universitas Hungarica)* in Nagyszombat with its foreign speaking professors had exercised little, if any, influence on the medical profession of the country. The role and effect of the university on the development of medicine had somewhat improved when it removed its seat to Pest in 1784. In the third decade of the nineteenth century, notwithstanding the paralyzing impact of the



Ferenc Bene

autocratic measures excercised by Emperor Francis, the university regained its spiritual influence and the medical faculty became the centre of the medical life of the country.

The question of Hungarian education, curriculum and teaching methods was controlled by the Order of Studies, 1777 (*Ratio Educationis*), which described the function of the university as follows: "... to make provisions for the youth of the country to procure a many-sided education, based on the sound instrument of science, to make them fit not only to occupy ecclesiastical and secular offices, but also to propagate learning within the country; consequently the Royal University should see that its professors as well as the learning taught by them should be superior to any other school in the country" [24].

The principles laid down in the Order of Studies continued to remain theoretical considerations. The suppression of the Hungarians, the obvious cause of the cultural backwardness of the country, did not cease until 1848. Consequently in the first half of the nineteenth century no progress could be made in the field of medicine, either.

The offices of the faculty of medicine, including the natural science institutions, the living quarters of assistants and of other officials, the clinic kitchen, etc. were all housed in the old Jesuit convent, on the corner of Hatvani Street and Új-Világ Street, crammed into 36 rooms [25].

Neither practical nor theoretical laboratory instruction could be carried on, not to say anything of scientific research, since there were neither patients nor institutes available. There was no means of making the simplest laboratory tests, such as the microscopic inspection of saliva, blood and purulent discharge, which were fairly common tests in the eighteen-twenties. Thus even the best students could obtain nothing more than a theoretical education at the university. The professors tried to keep in touch with new scientific results achieved abroad, but they themselves could not engage in either clinical or laboratory research. This was evident from the scientific publications that came out before 1848: there had been hardly any original contributions to the medical literature, the majority of the publications being only doctoral theses. The reason for this gap must have been financial conditions, and certainly not any special unfitness on the part of the professors who, on the other hand, proved their ability to write

by producing medical handbooks. Eager contributions came from Sámuel Rácz, József Plenck, Mihály Lenhossék, Teofil Fabinyi, Ferenc Bene and many others.

Vienna, responsible for the cultural policy of the Austro-Hungarian Monarchy, had taken good care that the University of Pest should not be a rival to her own university. To give one typical instance, the yearly allowance of the Institute for Anatomy, including all material expenses did not exceed 30 forints. The rest had to be supplied from private sources by the professor, Dr. Márton Csausz. The situation was exactly the same in the other university institutions. The University of Vienna, on the other hand, was not inclined to assume responsibility for the backwardness of the sister-institution in Pest and the medical circles of Vienna did not refrain from making ironic allusions on the bad conditions in the University of Pest, as, for example, the fact that owing to the insufficient number of chairs, the same professor was obliged to lecture on a great variety of subjects [26].

The medical staff of Pest University in the eighteen-thirties consisted of the following members:

Director of the faculty: Mihály Lenhossék (1773–1840), chief medical superintendent (*protomedicus Hungariae*). From 1809 to 1817 he lectured at the University of Pest, from 1825 onwards in Vienna, in physiology and "advanced pathology".

In the first three years of the medical course there were the following lecturers: Márton Csausz (1796–1860), pathology; Zsigmond Schordann (1794–1862), physiology; Lajos Tognio (1798–1854), pharmacology and pathology. There was no chair for pathological anatomy. Ferenc Bene (1785–1858) lectured on medicine and the skilled Ignác Stáhly (1785–1849) on practical surgery, János Weleczky (d. 1854) on theoretical surgery, Teofil Fabinyi (1791–1847) on ophthalmology, Ede Birly (1787–1854) on midwifery, Károly Bőhm on veterinary science, József Stadler (1791–1848) on chemistry and botany, János Reisinger on zoology and mineralogy.

According to the curriculum of 1813 the following subjects were taught in the five-year course:

First year: anatomy (Csausz), zoology-mineralogy (Reisinger), botany (Stadler).

Second year: physiology and advanced pathology (Schordann), chemistry-pharmacology (Schuster), practical pathology (Csausz).

Third year: pathology, pharmacology (Tognio), theoretical surgery (Weleczky), theoretical midwifery (Birly).

Fourth year: medicine (Bene), surgery (Stáhly), forensic medicine (Hoffner).

Fifth year: internal diseases (Bene), ophthalmology (Fabinyi), veterinary medicine (Bőhm).

The students of the surgical course attended surgery and midwifery with the medical students.

In 1786 it was decreed by Joseph II that the Municipal Hospital of Pest and the university clinics should be joined by closer ties, as was customary in all the countries of the Austro-Hungarian Monarchy. This convenient arrangement,

however, did not materialize, owing to the resistance of the city council. In 1843 Tódor Neumayer, councillor of the city of Pest, expressed the views of the city council in the following words: "The hospital cannot lend itself to teaching purposes, it is an independent organization run by its own doctors". In vain did the medical faculty insist that an independent university state hospital should be established in order to promote the practical training of doctors and provide more beds than available in the university clinics.

Owing to the intransigent attitude of the city council the University of Pest was, for a long time to come, deprived both of patients and cadavers, though they were available in sufficient numbers in general hospitals.

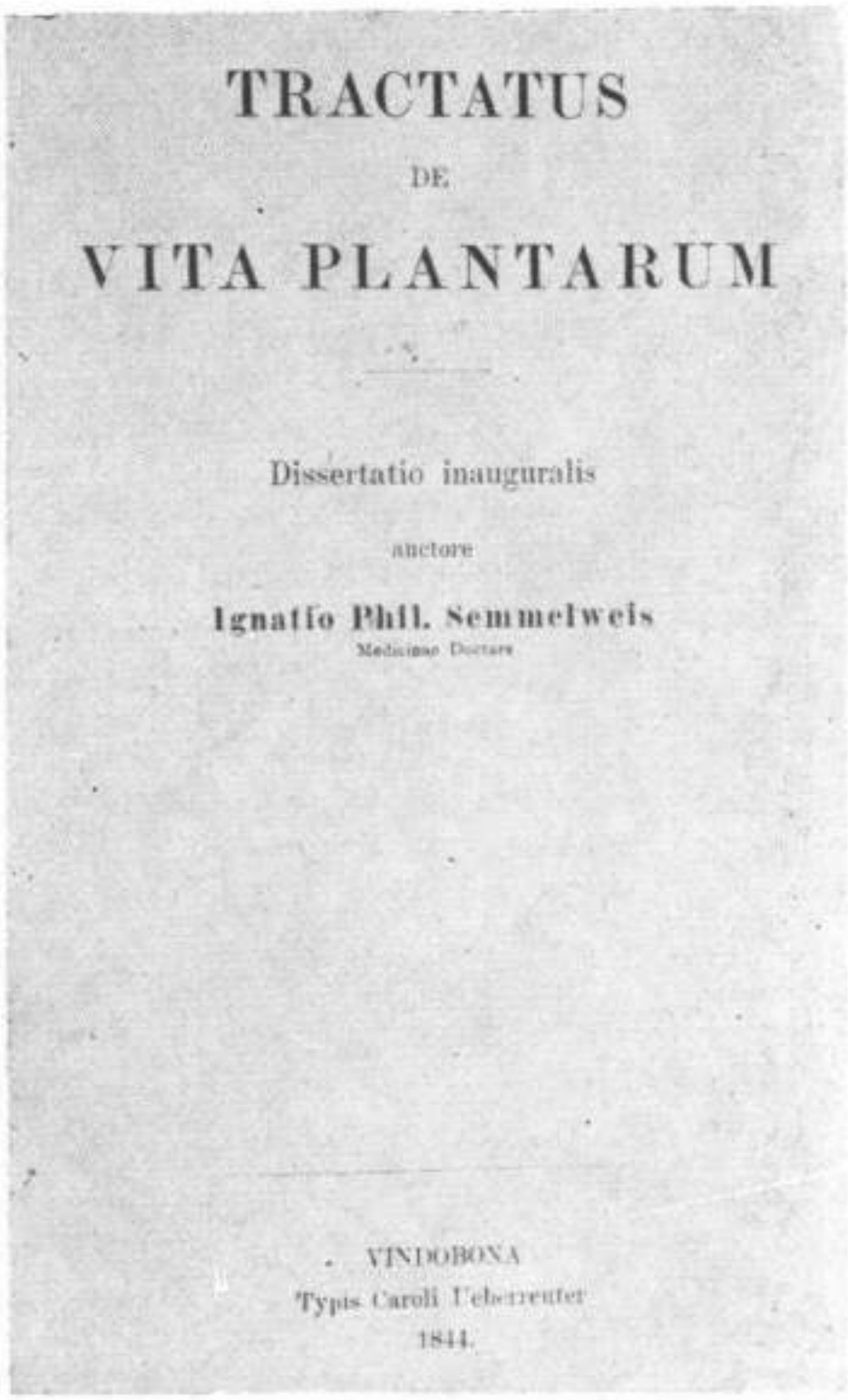
For lack of satisfactory material conditions practical instruction in the medical faculty in Pest had indeed been inadequate. The University of Vienna had patients in sufficient numbers, and no experience, teaching method or practical skill of the professors could counterbalance Vienna's attraction. As a matter of fact, the University of Pest had excellent teachers. First among them rank Ignác Stáhly, the great surgeon, Teofil Fabinyi, the founder of ophthalmology in Hungary and Ferenc Bene, the great teacher of medicine. The latter was the most popular among the professors of the university, and he was the greatest instructor in the medical faculty, the pioneer of hospital teaching. He organized the university's medical clinic with 12 (!) beds, where the medical students kept records of all the case histories. As the small number of patients did not offer enough opportunity for the students' instruction, Bene allowed them to visit his private patients. He recalled with gratitude the name of József Csehszombati, a general practitioner of renown in Pest who had trained Bene by taking him along to the homes of his patients and permitting him to attend his consultations [27].

Ferenc Bene had lectured from 1802 to 1816 to students of surgery on theoretical medicine, and from 1816 to 1840 to medical students on medicine. His handbook on internal diseases, written in Latin in 5 volumes, was used not only in Hungarian universities but in Italy and Russia, too. Gábor Doleschall, a former lecturer at the University of Pest paid him the tribute of a contemporary in his book published in 1882, where he stated that most of the professors of the medical faculty had been conscientious nonentities, but that Bene's professional and human stature towered above them all. Doleschall's account presents a lamentable picture of the level of the lectures in the medical faculty, of the attitude of the professors to the students, and of various difficulties in the faculty during the period 1830–1840 [28].

In these years there had been altogether eight lecturers in the medical faculty, with three additional lecturers on natural history. Mihály Lenhossék, returning from Vienna, as chief medical superintendent had drafted a motion in 1825, requesting that seven more medical subjects should be taught at the university, but owing to political and financial reasons nothing was done for many decades to come. This was the reason why the university had to call upon various specialists to lecture on certain subjects without pay, offering the title of Professor Extraordinary as compensation [15].

It was in this capacity that Lajos Arányi started his course of lectures on pathological anatomy on April 15th, 1844. As the first lecturer in pathological anatomy in Hungary he set about his task with enthusiasm and efficiency and within a short time he had produced a collection comprising thousands of exhibits [29].

Another difficulty can be explained by the fact that the university did not use the Hungarian language, which was greatly resented by those who had done so much in the early nineteenth century for its introduction. The medical generation of the Reform Age had tried to make up for the deficiency, but the backwardness of the university prevented it from playing an important role in national culture. Medical associations and societies had been formed as social organizations, without the participation of the university. The unprecedented nature of this state of affairs was commented on by Pál Nagy of Felsőbük, in a parliamentary debate in 1825 [30].


TRACTATUS

DE

VITA PLANTARUM

Dissertatio inauguralis

auctore

Ignatio Phil. Semmelweis

Medicinae Doctore

VINDOBONA

Typis Caroli Ueberreuter

1844.

Title page of Semmelweis's doctoral dissertation

Finally Act II of 1844 provided that "henceforth, in any official capacity, at home and abroad, the exclusive use of Hungarian shall be compulsory . . ." Previous to that, the Chancery in an appeal to the Presidential Council on December 29th, 1840, had appealed for proposals concerning the introduction of Hungarian as the language of instruction. The Presidential Council tried to solve the matter by addressing questions to the faculties of the University of Pest, and to the governing bodies of the academies and secondary schools. These were as follows: "Is it advisory and opportune to introduce Hungarian as a medium of instruction? What objections can be raised? What subjects and which classes could be taught in the language of the country (*patrio idiomate explicari*) in the following academic year?" The faculties of law and medicine sent back positive answers, stating that there was nothing to prevent Hungarian from becoming the language of instruction, as it coincided with the general interest and was also good for instruction. As it was, there had already existed subjects on which lectures had been delivered in Hungarian, as for instance, commercial law, and law relating to bills of exchange in the faculty of law. Anatomy, surgery,

obstetrics, ophthalmology and veterinary science had been lectured on in Hungarian in the faculty of medicine for the previous three decades. The faculty of arts, however, insisted that "the Latin tongue should also in the future be used in every subject (*pro omnibus in genere disciplinis*)". Teaching in Hungarian would not benefit the subject they maintained, since Hungarian was not yet developed enough and lacked technical terms; it was spoken neither outside Hungary, nor even by the majority of the professors themselves.

The attitude of the faculty of arts was not altogether wrong, at least as far as the question of technical terms was concerned. The fact that no medical language existed in Hungarian was a great difficulty in medical instruction. The diligent language reformer doctor, Pál Bugát, had only produced adequate equivalents in Hungarian for pathological expressions. No scientific books existed as yet in Hungarian, though Hungarian belles-lettres were flourishing. Even in the rover-meetings of doctors "mostly the Latin tongue was used: scientific, medical-surgical terms did not exist, and if used, would only be understood by the initiated" [31].

The medical faculty of Pest University was faced with other difficulties, too. The university was not responsible for producing its own curriculum, nor could it decide as regards vacancies on the professorial staff. Applicants had to go to Vienna to pass an examination before the Court Studies Commission (*Hof Studien Kommission*) set up in 1760. The results were published after consultation with the medical faculty of Vienna. The University of Pest did not even have a say in the matter, and could not decide on the qualifications to be expected from its own professors [32]. The freedom of teaching and learning, that is to say, a free Hungarian university did not materialize before the revolution of 1848–49.

A gloomy picture is painted of the university in the decades preceding the revolution by Imre Poór, corresponding member of the Academy, who in a memorial speech on the death of Ignác Sauer said the following on March 27th, 1871: "An inherent evil of the medical faculty of Pest University is that most of its students, if not in the first, but certainly in the fourth and fifth year, inevitably leave Pest and go on a pilgrimage to Vienna to complete their medical studies there. Nobody can blame a student for wanting to study more and for going to a place which offers him better chances.

"In the same year, when the medical faculty started to function a government decree deprived Hungarian doctors of the right to practise in Vienna and the German provinces of the Monarchy; whereas the Viennese graduates had the right to practise in any part of the whole Austro-Hungarian empire. Moreover, the Imperial University of Vienna, with the rich dotations from the imperial treasury can afford clinics, instruments, and museums for its medical chairs, and the best professors of the empire. The Royal Hungarian University of Sciences on the other hand has received only scraps from its own considerable fortune since the time of Joseph II and cannot afford, in the manner of foreign universities, proper equipment or clinics, not to speak of adequate teaching staff. Can we

be surprised, remembering these defiiciencies, and the advantages of Vienna University, that the tremendous experience and practical methods of Bene, Stáhly and Fabinyi were not enough to stop the students from mass-immigration to Vienna. No, individual talent will not heal the wounds of this country. It was a great mistake that not the Hungarian law was made responsible for public education and the Royal Hungarian University of Sciences, but that it was taken over by the government which, since the time of Joseph II, has been more close-fisted than that of the Austrians".

Poór had also the following to say: ". . . the medical faculty of Pest has neither authority nor scientific views of its own, consequently it was unable to develop a medical school of its own: its best students had not been trained at home but in foreign universities. The disciples of the Vienna school, either at home or abroad, are a credit to the place of which they are residents, but transplanted to Pest, without provisions for their deployment, they become, like the school of Pest, the mere echoes of Vienna".

Nevertheless it is to the credit of Hungarian medical history that despite poor conditions, it could produce such worthy men of science as János Balassa, Ignác Sauer, Lajos Arányi, Ágost Schoepf-Merei. Even beyond the frontiers of the country they had won respect for Hungarian science.

Doctor's Degree is Conferred on Semmelweis

After one year in the University of Vienna, Ignác Semmelweis returned to Pest where he studied during the academic years of 1839–40 and 1840–41 [33]. In the autumn of 1841 he again returned to Vienna to finish his studies.

His student years were spent in the happy atmosphere that characterized the social life of Vienna in those days. He did not have to worry about financial matters, and the gay young man easily became popular among the carefree student population. His playful, jocular nature made him very much liked. He soon won himself the pet-name "Semmelnazi". He was a young man of middling stature, blond with grey-blue eyes. He spoke the Swabian dialect of the Buda region, and he did not mind being actively and passively the butt of student jokes. He and his friends frequently visited his relatives in county Sopron, where they were welcome visitors and spent happy days on the country estate [34].

He passed his first doctor's examination with good results on November 8th, 1843, and the second with fairly good results on February 6th, 1844. His doctor's thesis was taken from the field of natural history (*Tractatus de vita plantarum*). At the end of the treatise he stated: "*Nullum venenum in manu medici*". Somewhat later he was forced to the conclusion that the very opposite was true, at least as far as the aetiology of childbed fever was concerned.

His doctor's investment ceremony should have been on April 2nd, 1844, but he was prevented from attending owing to his mother's death, which made him return post haste to Buda [35]. Actually he took his degree on May 21st, 1844.

It is worth mentioning that when receiving his degree he made a statement in the faculty register that he did not intend to stay in Vienna [36]. How fortunate for humanity that he changed his mind.

Notes

1. J. Antall, Semmelweis Ignác tabáni szülőháza és utolsó pesti lakóhelye (Birthplace in Tabán and Last Home in Pest of Ignác Semmelweis). *Műemlékvédelem* (*In Defence of Historic Monuments*), (1966) p. 2; Karl Semmelweis, Ignaz Philipp Semmelweis. *Burgenländische Heimatblätter* (Eisenstadt, 1965) pp. 99–101; M. Nitsch, A dunántúli németség (The Germans of Transdanubia). (Budapest, 1913) vols 4–21, p. 1. The documents of Szikra are at present in the parochial offices of Márczfalva. Before 1729 Szikra (Sieggraben) was the twin-village of Márczfalva. Ignác Hirschler, oculist, friend of Semmelweis kept records about him for Professor Hegar of Breslau. Here he states wrongly that the parents, or grandparents, of Semmelweis were settlers from Austria. This mistake accounts for the fact that many biographers speak of the Austrian origin of Semmelweis, even calling him Austrian.
2. F. Schams (1780–1839), citizen of Buda, *Vollständige Beschreibung der königlichen freien Hauptstadt Ofen in Ungarn* (Buda, 1822); F. Rómer, *A régi Pest* (*The Old Pest*) (Budapest, 1873); A. Gárdonyi, *50 esztendő Budapest székesfőváros történetéből* (*Fifty Years from the History of the Capital*). (Budapest, 1929); A. Vályi, *Magyar Országnak leírása* (*Description of Hungary*). (Buda, 1796–1799); J. Rupp, *Buda–Pest és környékének helyrajzi története* (*Topography of Buda–Pest and its Surroundings*). (Pest, 1868). The first topography that had been based on historical data and research, made in the Chamber Archives of Buda and the archives of both towns (i.e. Buda and Pest).
3. E. Mályusz, *A reformkor nemzedéke* (*The Generation of the Reform Age*). *Századok* (*Centuries*) (1923); J. Kósa, *Pest és Buda elmagyarosodása 1848-ig* (*Hungarization of Pest and Buda till 1848*). (Budapest, 1937).
4. G. S. Zakariás, *Adatok Buda építészetéhez a XIX. század első felében* (*About the Architecture of Buda in the First Half of the Nineteenth Century*). (Budapest, 1958); J. Antall, op. cit. pp. 2–4.
5. Municipal Archives. Buda Archives. *Conscriptio Animarum Ignobilium Suburbii Tabaniensis. Domus* 982, 932 (1805, 1809, 1815, 1819, 1821). — Ibid. Tabaner Haus-Gewöhr Protokoll; J. Antall, op. cit.
6. The family of József Semmelweis must have been related to other Semmelweis families in Buda who had come from county Sopron. They also intermarried with other good families in Buda, such as the Ráth, Leidl, Csekeő, Irányi, Sztankovics, Koischor, Horváth, Thiery, etc. families. Fülöp Müller was one of the richest citizens of Buda. He married three times, leaving three daughters and a son, Bernát Müller (1810–1901). The latter's son, Baron Kálmán Müller (1849–1926) became professor at the medical faculty and was chairman of the National Committee for Public Health between 1898 and 1926. According to verbal communication made by his great grand-daughter, Mrs. Alajos Köbler, Gyula Dollinger (Professor of Surgery at Budapest University, b. 1849, d. 1937, prof. 1897–1919) stated that Fülöp Müller had come from Cologne to Vienna where he was employed in a coach factory. He was recommended to Palatine Joseph, who brought him to Hungary. He established a coach manufactory in the first district János Square and became very wealthy. The daughter of his first wife, Terézia, was the mother of our Semmelweis. Data concerning the Semmelweis family had been copied verbatim from the following original church and civil registers:
(*a*) *Matricula Civium Budensium*, vol. II, *ab anno* 1790–1833.

(*b*) Parish Church of the Krisztinaváros district, marriage register vol. I, p. 92; vol. IV, p. 87; baptism register vol. V, p. 119.
(*c*) Parish Church of the Tabán district, baptism register vol. VIII, pp. 64, 93, 112, 134, 174, 232, 267, 334; vol. IX, p. 2; death register vol. VII, pp. 190, 276; marriage register vol. V, p. 39.
(*d*) City Parish Church, baptism register vol. XXII, pp. 74, 164; vol. XXIII, p. 47; death register vol. XI, p. 249; vol. XII, pp. 11–14; vol. XV, p. 21.

7. It is worth noting the many variants in the spelling of the family name. They are given below in the order of their occurrence:

1806	Semelweis,	József *(Matr. Civ. Bud.)*
1810		József (mar.)
1812	Semelveis,	Anna Mária (mar.)
1820		János (bapt.)
1842		József *(Matr. Civ. Pesth.)*
1811	Zemelveiss,	József (bapt.)
1813	Zemelveisz,	Károly Fülöp (bapt.)
1814	Szemelveis,	Fülöp Alajos (bapt.)
1815	Szemelveisz,	Julianna Anna (bapt.)
1818	Semelvais,	Ignác (bapt.)
1821		Ágoston (bapt.)
1823		Alojsia (bapt.)
1827	Semelvaisz,	Mária Teréz (bapt.)
1836		Julianna (mar.)
1844	Semmelveisz,	Mrs. József (death)
1864		Antónia (bapt.)
1846	Semmelvaisz,	József (death)
1857	Szemmelweisz,	Ignác (mar.)
1859		Mária (bapt.)
1860		Mária (death)
1861	Semmelweis,	Margit (bapt.)
1862		Béla (bapt.)

Ignác Semmelweis always used the last variant.

8. The eldest brother of Ignác owned a big grocery store (*Spezerei-Colonial- und Farbwaren-händler zum Zuckerhut*), opposite to the medical faculty of Pest (*Der Pesther Stadt und Landbote für das Königreich Ungarn* 1840; *Pester Bote* 1856. p. 228). József married, on 18th May 1840, Johanna Kozgleba. Their children: Ilona, Károly, Rózsa Erzsébet and József Antal. Among them Károly changed his name to Szemerényi in 1881. After József's death in 1861 the grocery store had already been possessed by Béla, the brother of Johanna Kozgleba. The house of the latter under 16 Világ Street was bought by Károly Semmelweis in 1868.
9. Three of the Semmelweis brothers fought in the Hungarian War of Independence of 1848–49 against the Austrians, eloquently proving the Hungarian loyalties of the family. After Hungary's defeat, the brothers, except the eldest, were compelled to flee abroad. Cf. L.E.F. Podach, *I. Ph. Semmelweis*. (1947) p. 70. Owing to his participation in the war, Károly Semmelweis was suspended from his office as clergyman. It was only years later that he was pardoned. In 1888 we meet him in Pozsony as canon. As chaplain of Komárom he officiated at the wedding of his brother Joseph with Johanna Kozgleba. On August 3, 1849 Geringer, imperial commissioner, appealed to Bishop József Kuncz, representative of the primate of Esztergom in Vienna, to deal with the "rebel" priests in Pest and suspend

them from office. Among these figures the name of Károly Szemerényi (Semmelweis). The copy of his appeal was also sent to Haynau, the latter endorsing it at his post in Szeged, August 6th, No. 752 (1849). G. Lajos Némethy had the following to say about Károly Szemerényi: "*Szemerényi (Semmelweisz) Carolus Natus 9. Jan. 1813. Budae Philosophiam Tirnaviae, theologiam Pestini terminuit. 26. Mart. 1736* [!] *ordinatus Cooperatorem egit in Tardoskedd. Kemencze. Kürth. Comaromii et Pestini ad Assum. Annis sedecim. 1850. ob politicas causas muneri sue abdicare necessitatus privatam egit vitam. 1852. edicator ad princ. Saulkovszky* [!] *Viennam vocatus sed positis per policiam obicibus, post biennium recedere coactus. Iterum privatam concinuavit vitam. 1860. Herul. Jankovics praefectus constitutus ubi usque 1865. activus erat. 6. Jul. 1867. adm., mox parochus in Ogyala. Ab. 1863* [?] *VA diac., sur. distr. Udvard. Hinc 3. Aug. 1876 promotus ad Tardoskedd una VA diac. ordin. distr. Érsekujvár. 1888. canonicus Posoniensis*". *Series parochiari et parochorum Archi-Diocesis Strigoninensis ab antiquissimis temporibus usque annum MDCCCXCIV Jussu et sumptu I. Card. Simor.-Ludovicus Némethy de eadem Strigonii, Typ. Buzárovits* (1894) p. 1064.

10. Péter Ráth (1812–1873), chemist of Buda, had been chairman of the Pharmaceutical Society, established in 1847, for 20 years. From 1868 he was Member of Parliament for Buda. For a short time he was chairman of the Hungarian Pharmaceutical Union, established in 1872. He married Julianna Semmelweis on May 28th, 1836. The document was witnessed by Professor Florianus Birly, and Bernardus Müller, "pharmacopeus". Károly Semmelweis officiated at the ceremony.
11. The house, Váci Street 17–19, where Semmelweis lived after his marriage was owned by Mrs. Mária Szemerényi, the widow. Cf. *Budapester Adressen- und Wohnungs-Anzeiger 1880–1881.* (Budapest, 1882).
12. An Interview with Mrs. M. Semmelweis. *Magyar Hírlap* (*Hungarian News*), Oct. 2nd (1906).
13. I. Darvas states in an article in the *Orvosok Lapja* (*Journal of Physicians*) (1947) p. 211, that Ignác Semmelweis changed his name to Szemerényi at the age of 31, i.e. in 1849. This seems to be wrong as he had used his original family name until his death.
14. Gy. Szalay, *A királyi egyetemi katholikus gimnázium története 1689–1937* (*History of the Royal University Catholic Gymnasium.* (Budapest, 1937) p. 207.
15. E. Finánczy, *A magyarországi közoktatás története Mária Terézia korában* (*The History of Hungarian Education in the time of Maria Theresa*). 2 vols (Budapest, 1899–1902).
16. It is not unprecedented in the history of sciences to find a great scientist who was not attracted at first by the subject in which he was later to excel. Michael Faraday, too, only happened to visit by chance Davy Humphrey in his experimental workshop where he was to stay for a lifetime.
17. András Józsa was the first president of the Hungarian Association, he was later to become medical-officer-in-chief of county Szabolcs, and founder of the museum to be called after him. The Hungarian Association closed down in 1880, because the number of Hungarian students studying in Vienna had considerably diminished.
18. "*Où est ce que l'observation, si l'on ignore où siège le mal.*"
19. R. T. H. Laennec, *De l'auscultation médiate ou Traité du diagnostic des maladies des poumons et du coeur fondé principalement sur ce nouveau moyen d'exploration* (Paris, 1819).
20. *Hufelands Schriften über Homeopathie und die Achtzehn Thesen von Paul Wolf.* Ed. by Hans Wapler (Leipzig, 1921) p. 92.
21. K. A. Wunderlich, *Wien und Paris* (Stuttgart, 1841).
22. Karl von Rokitansky was Professor of Pathological Anatomy from 1844 to 1875. He began writing his memoirs, Oct. 6th, 1876 (*Selbstbiographie und Antrittsrede.* Ed. by Erna Lesky. Beitrag zur Geschichte der Universität Wien III. (Wien, 1960). Hermann Böhlens Nachf. p. 111.) His sudden death on July 23rd, 1878 prevented him from completing it. In his personal account of the great disappointment, no mention is made of either Semmelweis or Virchow, or the crasis theory. In spite of these arbitrary omissions, we obtain a deep

insight into the peculiar conditions prevailing at the University of Vienna, and also into the events of his personal life. His inaugural speech made when appointed professor contains his scientific programme. His son, Hans Rokitansky (1839–1898) was made assistant in the 1st Obstetric Clinic in 1864 and became head of department in the gynaecological department of the Maria Theresa Hospital, Vienna with the title of Professor Extraordinary. In 1892 he was appointed to the chair of obstetrics and gynaecology in the University of Graz.

23. Ernő Schwimmer (1837–1898), Professor of Dermatology in the University of Budapest, in his memorial address on Prof. Hebra's death on Oct. 11th, 1881 did not allude to the relationship between Semmelweis and the former. Frigyes Korányi, on the other hand, in his memorial speech on Skoda's death dwelt on the relationship of Semmelweis and Skoda, with emphasis on the latter's brave support. Yearbook of the Budapest Royal Medical Society (Budapest, 1882) Appendix, p. 32.
24. *Ratio Educationis*, issued August 22, 1777, makes full provisions for the whole system, organization, curriculum and method of secular education, from the university down to the village school. Translated into Hungarian and edited with notes by Aladár Frimml. Pedagogical Library series (Budapest, 1913) p. 27.
25. Up to 1860 the following institutes (*instituta facultatis medicae*) had functioned in the medical faculty of the University of Pest:
    1. Natural-history collection (*Museum rerum naturalium*), mineral and zoological collection in three rooms.
    2. Chemical laboratory (*Laboratorium chemicum*) in two rooms.
    3. Anatomical theatre (*Theatrum anatomicum*) in three rooms.
    4. Physiological-anatomical museum (*Museum anatomico-physiologicum*) in four rooms, housing the wax moulage collection made by Fontana at Florence, and presented to the medical faculty by Emperor Joseph II in 1789.
    5. Botanical gardens (*Hortus botanicus*).
    6. Five clinics (*Clinica quinque*): two medical clinics, the 1st for physicians (*Clinicum medico-practicum*), the 2nd for surgeons (*Clinicum medicum pro chirurgico*) with eight beds: 3. surgical clinic (*Clinicum chirurgicum practicum*) with nine beds; 4. obstetric clinic (*Clinicum obstetricum*) with 15 beds; 5. ophthalmological clinic (*Clinicum ocullisticum*) with nine beds.
    7. A collection of surgical instruments placed in six cupboards (*Instrumentarium chirurgicum*).
    8. Institute for veterinary medicine (*Institutum veterinarium*). In the time of Semmelweis the total number of clinical beds did not exceed 54.
26. Cf. the memorial address on the death of Márton Csausz made by József Lenhossék in 1864.
27. József Csehszombati (1748–1815), general practitioner in Pest, who had backed up Ferenc Bene. In his will he left 25 000 forints to the Calvinist Academy of Debrecen for the establishment of a chair of chemistry and botany, with lectures in Hungarian.
28. G. Doleschall (1813–1891), physician of Miskolc, *Életem, eszményeim és 42 éves orvosi gyakorlatom* (*My life, my Ideals, and 42 Years of Medical Practice*). (Miskolc, 1882).
29. *Orvosi Tár* (*Medical Review*) (1884) p. 271.
30. Act 25 of 1791 and Act 7 of 1792 stipulate that every office-holder who enters public service in Hungary must be able to speak Hungarian, but neither act was ever enforced. Professor Emil Ponory Thewrewk (His Speeches, Budapest, 1905. p. 30) quoting Miklós Révai, states that at the turn of the nineteenth century, the majority of the professors of Pest University could not speak Hungarian.
31. Gy. Gortvay, *Az újabbkori orvosi művelődés története* (*The History of Medical Culture in Recent Times*). (Budapest, 1953). p. 86.
32. Unfortunately the faculties themselves were not always entirely objective in matters of vacancy. For the chair of physiology in 1820, the great scientist and staunch friend of the

Hungarians, Purkinje was only second on the list, the same as Semmelweis in 1855. Cf. T. Győry, *Az orvostudományi kar története* (*The History of the Medical Faculty*) 1770–1935, in *A Magyar Királyi Pázmány Péter Tudományegyetem története* (*The History of the Royal Hungarian Pázmány Péter University*). vol. III (Budapest, 1936).

33. As recorded in the registers of the medical faculty of Pest (*Protocollum susceptionis auditorum facultatis medicae Regiae Scientiarum Universitatis Pestiensis: Classificatio auditorum in facultate medica Reg. Scien. Univ. Pest.*), Semmelweis attended there during the years 1839–40 and 1840–41. According to the 'classification register' Semmelweis was awarded the following distinctions in the academic year of 1839–40: *Classis morum: fleissig; physiologia et anatomia sublimioris: prima cum eminentia* (*Sigismundus Schordann prof.*); *chemia: prima classis; pharmakognosia: prima classis cum eminentia* (*Jos. Sadler prof.*); *anatomia practica: prima classis* (*Mart. Csausz prof.*). In 1840–41: *Pathologia generata: prima classis cum eminentia; pharmacologia: prima classis cum eminentia* (*Ludovicus Tognio prof.*); *chirurgia theoretica: prima classis cum eminentia; acologia: prima classis cum eminentia* (*Joannes Veleczky prof.*); *obstetricia theoretica et practica: eminens* (*J. Birly prof.*).
34. Schürer von Waldheim, the eminent biographer of Semmelweis, believes that he was a man of a pleasant, happy disposition. He enjoyed life to the full, without worrying about problems, conscious of the pleasure of the moment. His naive, child-like humour accompanied him, after his student years, to the very end. He could forget himself in joyful laughter over a joke, and give full expression to his satisfaction when in the company of friends. Fritz Schürer von Waldheim, *Ignaz Philipp Semmelweis.* (Wien und Leipzig, 1905) p. 235. Ignatius Hirschler, oculist in Budapest, was after Lajos Markusovszky his second best friend. At the request of Hegar, Hirschler kept a diary, marking the events in the life of Semmelweis. Unfortunately the diary has been lost. Rezsö Temesváry, who read the diary, in an interview to a daily paper [*Pesti Napló* (*Diary of Pest*), Febr. 6th, 1926] confirmed that according to Hirschler, Semmelweis was of a happy disposition, truthful and open-minded, extremely popular with friends and colleagues in Vienna.
35. *Verzeichnis der an der Medizinischen Fakultät der Universität Wien von Anfang des Jahres 1774 bis zum Ende des Jahres 1848 promovierten Doktoren der Medizin.* Part I (A–L), Part II (M–Z). Suppl. In *Tätigkeitsberichte des Archives der Universität Wien für das Jahr 1959.*
36. Schürer von Waldheim, op. cit. p. 3.

Chapter Two

Aetiology of the Puerperal Fever

Semmelweis as lecturer in the 1st Obstetric Clinic, University of Vienna — Doctrines concerning the aetiology of puerperal (childbed) fever before Semmelweis — Semmelweis recognized that puerperal fever was not a specific infection — Not a chance discovery

Semmelweis as Lecturer in the 1st Obstetric Clinic, University of Vienna

After taking his degree Semmelweis would have liked to get a post in Skoda's medical clinic, but Prof. Skoda had promised the vacancy to a doctor, of the name of Gustav Loebl (1816–1880), who was Semmelweis's senior [1]. As a result, Semmelweis started his career as a consultant physician both at the obstetric clinic and the surgical clinic of the General Hospital. Between July 1st, 1844 and February 27th 1846 he had already functioned in the capacity of an "aspirant externist" and had twice attended obstetric courses held by the lecturer, Dr. Chiari. He obtained his master's degree in midwifery in the following year, and on November 30th, 1845 graduated as an operating surgeon.

With the permission of Prof. Rokitansky he had simultaneously visited the Institute for Pathological Anatomy, where in the early morning hours he had done regularly autopsy work, mainly on the cadavers of the obstetric clinic. He soon became an expert in pathological anatomy, which later was to help him in the solution of the puzzle of childbed fever. He has the following to say about his experiences: "Since the day I decided to devote my life to the study of midwifery, i.e. since 1844, and until the time I returned to Pest in 1850, before the professional visits in the mornings, I had regularly examined obstetric cadavers in the anatomical theatre of the General Hospital. This was all thanks to Prof. Rokitansky, who showed friendship towards me, for which I express my great gratitude. With his permission I examined all the obstetric cadavers, and had they not been marked anyway for that purpose, I myself made the autopsy in order to compare my observations with these findings" [2].

On February 27th, 1846 Semmelweis was appointed as aspirant lecturer, and on his 28th birthday, on July 1st, 1846 as regular lecturer. He worked in that capacity until October 20th, 1846, and after an interval of six months, from March 20th, 1847, his appointment was extended for another two-year period.

A lecturer's job in those days was very exacting, and it took up most of his time. It was his daily duty to visit the patients in the ward early in the morning, in preparation for the professorial round, to assist at the operations, and to do the clerical work of the department as well. Except for the lectures, which were deliv-

ered by the professor, he was responsible for the instruction of the medical students, in the early morning hours at the autopsy theatre, and in the afternoons in the wards, by means of practical examination and demonstration. In Semmelweis's days each clinic had still to perform the autopsy of the patients who died in their wards. In the 1st Obstetric Clinic Semmelweis was responsible for this, too. Besides he was on duty at odd times, and performed all the obstetric operations that had to be done during the night.

The lying-in department of the General Hospital in Vienna, divided into two separate clinics, was then one of the greatest of its kind in Europe. In those days Johann Klein (1788–1856) was director of the 1st Clinic, where he had worked since 1822, and Klein's assistant, Franz Xaver Bartsch (1800–1861) had been at the head of the 2nd Clinic since 1842.

Semmelweis threw himself whole-heartedly into his manyfold activities. All his biographers make special mention of his diligence and ambition. This gay, carefree young student of Vienna had developed into the most active and painstaking doctor in the hospital. But no sooner had he established himself in the clinic that he found himself face to face with the ancient curse of midwifery, childbed fever.

The high mortality rate of labouring women was a constant anxiety for medical science at the time, and it had not escaped the attention of the young doctor, either. Habit had not made Semmelweis indifferent to the suffering of women. The honest, noble young man was greatly perturbed, and he could not reconcile himself to the idea that high mortality should be an inescapable fate of labouring women. He was deeply moved by the ravages of this form of death: there had been months when as much as 30 per cent of all labouring women died in childbed fever.

The shock produced by his first experiences in clinical work gave rise to his decision to throw in his feverish energy and knowledge to save all labouring women from this dreadful end.

Doctrines Concerning the Aetiology of Puerperal (Childbed) Fever before Semmelweis

The problem of puerperal fever had existed long before the time of Semmelweis. The feverish condition connected with childbirth had been known in all ages beginning with ancient times. Hippocrates, Galen, Aretaeus, Avicenna had all made observations concerning the disease. As regards the origin of the illness, the oldest doctrine believed that the suppression of a cleansing process at parturition, a lochia, sometimes the remaining portions of the placenta in the uterus might cause *febris lochialis* which could poison the whole system. Today this condition is called lochiometra. It is to the credit of the keen observation of the doctors of ancient times that they had recognized the relationship between lochia and decomposed placenta particles in the uterus, and the feverish condition following child-

birth; a relationship which in fact existed in certain cases. There had been many among the obstetricians of later periods, too, e.g. the French Mauriceau (*fièvre maligne*), who adopted the same theory.

Nevertheless, the disease was not yet common in ancient times and in the Middle Ages, and it was not before the seventeenth and eighteenth centuries that it was recognized as one affecting many labouring women. This was at a time when social progress and humane considerations had produced special homes. The first cases of childbed fever "epidemic" outbreaks are known to have occurred in France between 1662 and 1664, then in 1770 and 1776, in London in 1760, in Dublin in 1767 and in Vienna in 1770–1771. The disease seemed to have affected in greater number and more frequently the lying-in hospitals from the second decade of the nineteenth century onwards, i.e. from the period when pathological anatomy was the dominating feature in medicine. It soon became apparent that childbed fever was a hospital disease; very little, or not at all known in backward countries where there were no hospitals [3].

Childbed fever as a specific disease has been known since the middle of the sixteenth century. Before that time this feverish complication of puerperium had not been recognized as a specific disease. The concept of puerperal fever did not yet exist. Thomas Willis was the first scientist in modern times to use the term *febris puerperarum*; in his excellent work published in 1662 he gave correct description of its symptoms [4].

In the seventeenth century the so-called milk-fever theory had been predominant, the belief being that puerperal fever was caused by various troubles in the milk-process, such as it moving in the wrong directions (finding its way to the head). This theory had many supporters, first among them Daniel Sennert (1512–1637) [5], and Thomas Willis mentioned above, but it was in the seventeenth and eighteenth centuries also shared by outstanding doctors and obstetricians, such as Sydenham, Astruc, Sylvius de Boe, Levret (*apopléxie laiteuse*), Smellie, Van Swieten, Boerhaave, etc. [6].

In the second half of the seventeenth century the Frenchman Nicolas Puzos (1686–1753) believed in some sort of milk transference, the metastasis of the milk (*métastase laiteuse*) into the organs of the abdominal and pelvic cavities, speaking of milk-peritonitis (*péritonites laiteuses*).

It is amazing that the milk-theory being without any serious foundation and lacking even the elements of observation, could have prevailed for so long, even cropping up in the doctrines of well-known physicians and obstetricians in recent times. Prof. Boer, Johann Klein's predecessor, and Klein himself still taught the milk-theory.

At the end of the eighteenth century the so-called phlogistic theory came into prominence, according to which puerperal fever was caused by the inflammation of various abdominal and pelvic organs. Traces of this theory can be found at the beginning of the seventeenth century in the works of Felix Plattner [7] who associated puerperal fever with the primary local inflammation of the uterus (metritis). Harvey, in 1651, seemed to have shared the same view.

Th. Kirkland (1721–1798) believed that beside focal metritis there must be some unknown general factor causing puerperal fever, John Hunter (1718–1783) identifying this with peritonitis. Nathaniel Hulme (1732–1807), on the other hand, upheld the theory that puerperal fever was attributable to the inflammation of the intestines, caused by impure elements within the bowels [8]. Among the advocates of the phlogistic theory Claude Pouteau's (1725–1775) attitude deserves special attention. He alleged that puerperal fever was an erysipelas of the bowels and the peritoneum [9]. This doctrine inaugurated the "contagion"-theory, prevailing particularly in England. It was rooted in the correct belief that puerperal fever was an infectious disease, but it was incorrectly identified with erysipelas. Somewhat later, Leon Jean Cruveilhier (1791–1874), a French pathologist, Professor of Pathological Anatomy in the University of Paris, reached the conclusion that puerperal fever was in intimate relationship with typhus and typhoid fever (*puerperaltyphus*). He also upheld the theory that a labouring woman was like a wounded person whose illness may be caused by hospital miasma.

The adherents of the so-called physiological school, as Autenrieth himself, professed that certain materials accumulating during pregnancy disappear in normal parturition, but owing to various disturbing factors (e.g. cold, or other illnesses) the blood "deteriorates", a form of which is puerperal fever. Other advocates of the same theory were in 1826 Ad. E. von Siebold (1786–1851), in 1832 F. Ritgen (?–1867) and in 1839 D. W. H. Busch (1788–1858).

There were others again who professed the view that puerperal fever was no disease *sui generis*, similar conditions being possible besides childbed as well. This discovery which is not far from the truth was supported by Theodor Helm and Franz Schuch [10].

During the first half of the nineteenth century in Germany the phlogistic theory continued to dominate. F. B. Osiander believed puerperal fever to be caused by the inflammation of the peritoneum and of the omentum (*Netzfieber*), while the famous German obstetrician, F. K. Naegele (1778–1851) considered it to be an inflammation of the tube and the ovary. This theory at least discards beliefs in milk-poisoning, milk-metastasis, deterioration of blood, etc. by recognizing local inflammation, specifically of the sexual organs.

Before Semmelweis it was thought that childbed fever was exclusively connected with pregnancy and parturition. While doctors on the Continent believed themselves powerless when faced with the *genius epidemicus*, in England, about the end of the eighteenth century, the advocates of the contagion-theory were firmly convinced that the "contagion" of childbed fever could be defeated, as the epidemic spread through the air. In order to keep the air of the wards pure, they suggested frequent airing, cleanliness, the application of sulphuric and chlorine disinfectants; and to prevent the spread of the contagion they strictly secluded the affected patient from the rest. Without recognizing its specific characteristics, still considering it an acute infectious disease like erysipelas, scarlet fever, smallpox, malaria, etc., yet by producing an effective prophylaxis they had been able to partially prevent the spread of the disease.

Charles White, a surgeon and obstetrician of Manchester, insisted in his work published in 1773 [11] on the importance of maintaining absolute cleanliness in the wards of labouring women. He made practical suggestions as how to keep the wards clean, the floor, and air uncontaminated, yet he had nothing to say about the personal cleanliness of the doctors and nurses. Thomas Denman, a London obstetrician [12] was the first to insist, in 1782, on the importance of the cleanliness of the medical staff, stating also that puerperal fever can be contracted by the healthy through the medium of doctors and midwives. Also Denman classed puerperal fever as a specific contagious disease. Alexander Gordon [13], too, stressed the part played by doctors and midwives in the communication of puerperal fever, although he still considered it to be the erysipelas of the intestines and peritoneum. In his book published in 1795 he makes the following statement: "And if in the dissection of a putrid body a surgeon scratches his finger, the part festers, that is, inflames and suppurates; and if a fever should be the consequence, it is inflammatory in the beginning and only ultimately putrid . . . In like manner if putrid material be applied to the uterus, it inflames that organ and the contiguous viscera; that is, it gives rise to the puerperal fever, which is ushered in with a cold stage and succeeded by a very rapid pulse and acute pains in the abdomen". To give force to his views, Gordon insisted not only on the disinfection of all objects, but demanded also the highest degree of personal cleanliness from doctor and midwife. It is worth recording that in the supposed relationship of puerperal fever and erysipelas, Gordon insisted on its relations with pyaemia, nevertheless he suggested purgation and the letting of large quantities of blood in the therapy of puerperal fever. This seeming inconsistency seriously affected the acceptance of his theory by his contemporaries.



Oliver Wendell Holmes

Oliver Wendell Holmes of Boston, USA anatomist and professor of Harvard University [14], shared the views of the English contagionist school half a century later, and in his book written in 1843 he called attention to the contagiousness of puerperal fever, and to preventive measures. Without wishing to enter into any debate as to how contagion may come about, whether through the air, or by the

medium of the doctor, his preventive measures refer mainly to the personal cleanliness of the practitioner, through which aseptic conditions could be brought about [15]. He is the first to mention the tremendous danger of dissection. His preventive measures, as can be seen in the text following below, differ greatly from those prescribed by Semmelweis after his discovery some are of secondary importance, and derive from his misunderstanding of the essential features of the disease.

O. W. Holmes suggested 8 points as means of prevention, given here in his original wording:

1. A physician holding himself in readiness to attend cases of midwifery should never take any active part in the post mortem examination of cases of puerperal fever.

2. If a physician is present at such autopsies, he should use thorough ablution, change every article of dress, and allow twenty-four hours or more to elapse before attending to any case of midwifery. It may be well to extend the same caution to cases of simple peritonitis.

3. Similar precautions should be taken after the autopsy of surgical treatment of cases of erysipelas, if the physician is obliged to unite such offices with his obstetrical duties, which is in the highest degree inexpedient.

4. On the occurrence of a single case of puerperal fever in his practice, the physician is bound to consider the next female he attends in labour, unless some weeks at least have elapsed, as in danger of being infected by him, and it is his duty to take every precaution to diminish her risk of disease and death.

5. If within a short period two cases of puerperal fever happen close to each other in the practice of the same physician, the disease not existing or prevailing in the neighbourhood, he would do wisely to relinquish his obstetrical practice for at least one month, and endeavour to free himself by every available means from any noxious influence he may carry about with him.

6. The occurrence of three or more closely connected cases in the practice of one individual, no others existing in the neighbourhood, and no other sufficient cause being alleged for the coincidence, is *prima facie* evidence that he is the vehicle of contagion.

7. It is the duty of the physician to take every precaution that the disease shall not be introduced by nurses or other assistants, by making proper enquiries concerning them and giving timely warning of every suspected source of danger.

8. Whatever indulgence may have been granted to those who have heretofore been the ignorant causes of so much misery, the time had come when the existence of a private pestilence in the sphere of a single physician should be looked upon not as a misfortune but as a crime; and in the knowledge of such occurrences the duties of the practitioner to his profession should give way to his paramount duties to Society.

At the end of the eighteenth century it was already believed possible that those in charge of women in labour might also be responsible for the infection and spread of the disease without being aware of it. In spite of the firm stand taken by the contagionists in the matter, on the Continent women were put into the same ward irrespective of their being pregnant, in labour, in childbed, with or without puerperal fever, healthy or sick. After a patient had left, her place was taken by a new one, and it was not thought necessary to change the linen and disinfect the bedclothes [16]. In the first half of the nineteenth century the opinion was still firmly rooted in medicine at large that the ultimate cause of puerperal

fever was atmospheric,—a mysterious, cosmic, uncorporeal something, a miasma, which affected those who were susceptible to it. Once the disease was produced, a "secondary miasma" might form in the patient's constitution and, combined with the miasma, develop into different types of diseases, more or less serious, of longer or of shorter duration (extending over a region, or restricted to a hospital only), which finally culminated in an epidemic. Epidemic outbreaks, on the other hand, were due to cosmic, telluric influences.

Many outstanding physicians in the nineteenth century believed in the strangest doctrines. Karl Gustav Carus said in 1829 that childbed fever (*febris puerperarum*) was the disturbed state of the revolution raging in a woman's body at the time of parturition [17]. D. W. H. Busch, on the other hand, in 1843 seemed to have found the cause of puerperal fever in mechanical conditions, that is, in the pressure exercised by the pregnant uterus on the viscera of the abdomen and in the stretching and distension of the peritoneum [18]. Scanzoni (1846) considered puerperal fever a puerperal dyscrasia caused by hyperinosis. By hyperinosis it was understood that fibrin increased in the blood during pregnancy, producing a fibrinous exudation on the peritoneum and other serous membranes, resulting in the deterioration of blood and pyaemia [19]. Scanzoni did not think that the wounded condition of the womb could be responsible for puerperal fever. Litzmann and Kiwisch believed that puerperal fever was a specific disease, caused by miasma which, developed into deterioration of blood, producing finally local changes, such as peritonitis, metritis, phlebitis, etc. It was not thought, however, that there existed a close connection between local changes and the fever.

In the first half of the nineteenth century though many false views had been propagated, nevertheless here and there some approaches had been made towards the truth concerning the essence of puerperal fever. In this context we should mention the names of Per Gustav Cederschiöld (1782–1848) in Sweden and of Samuel Kneeland in England, the former insisting in 1839, the latter in 1846, on the importance of the cleanliness of the sexual organs, and on disinfecting bedclothes and the body itself. Nevertheless, like the English contagionists and Holmes, they, too, considered puerperal fever as a disease, *sui generis*, without recognizing the connection between an infected wound and puerperal fever [20]. In 1844 Thomas Watson (1792–1882) published a book in England in which he dwelt at length on the importance of the hand in the spreading of the infection [21]. It was the great French clinical expert A. Trusseau, who first declared that puerperal fever was not a specific disease and insisted that a similar feverish state had been observed in male patients. He did not, however, go beyond making these statements [22]. The real nature of the disease was more guessed than recognized by Gottfried Eisenmann, a physician of Würzburg [23], who in his book published in 1857, said explicitly that "the whole doctrine of puerperal fever is based on that of infected wounds" [24], and infection was transmitted by the uterus wounded during parturition, or possibly by means of the lungs. In his later discussion, however, he got mixed up and formulated confused doctrines as regards epidemics and miasma, quoting lavish pathological examples,

and ending in a medley. Without recognizing the real mechanism of the infection, he insisted that the entrance of the miasma producing infection was the mucous membrane of the uterus, suggesting chlorine (!) oblutions to prevent the "putrescence of the uterus".

When summarizing the doctrines and theories on puerperal fever before the discovery of Semmelweis, we must say that many of these had hit upon the truth, and had recognized certain essential features of the disease. Apart from the English contagionists, however, no one had understood the importance of obstetric hygiene and of obstetric prophylaxis. None of the doctrines had been able to throw light on the evident fact that precisely the lying-in hospitals had become the hotbeds of puerperal infection, and nobody had yet discovered the circumstances and mechanism of the infection. In spite of some obvious half-truths in the medley of doctrines, superstition and ignorance had prevailed. It is strange that physicians should have believed in cosmic, telluric miasma, atmospheric influences, and mass infection produced by *genius epidemicus*! They imagined that puerperal fever was inevitable, and could find no better means of defeating it than to close the doors of the lying-in hospitals from time to time, when puerperal epidemic was raging among the labouring women. No doubt, the contagionists had come nearest to the truth, but by regarding puerperal fever as a *sui generis* infection, they had missed the essence, making it impossible to produce prophylactic methods for prevention.

Nobody before Semmelweis had clearly recognized that the immediate cause of puerperal fever was unclean manual intrusion, and that the disease itself was only another kind of pyaemia.

Semmelweis Recognized that Puerperal Fever was not a Specific Infection

Clinical duties had made it possible for Semmelweis to study the question of high mortality among labouring and childbed patients. Not for a single moment would he believe that it was inevitable. From the day his duties started he closed his ears to superstitious beliefs. He could not possibly see how expirations and exudations of labouring patients could cause high mortality, neither would he believe in miasmic influences, in *genius epidemicus*, and in epidemics caused by cosmic or telluric influences. If these influences were really operating, he argued, why should they be confined to a single lying-in hospital of Vienna, and why should puerperal epidemics rage only at certain periods of the year? Puerperal fever, being a tangible fact, must necessarily be produced by tangible causes.

The first thing that had struck Semmelweis was the remarkable difference in puerperal fever mortality between the two neighbouring clinics. In 1846, for instance, in the 1st Obstetric Clinic, where he worked, out of 4 010 labouring patients, 459 had died of puerperal fever, a total of 11·4 per cent, while during the same period, in the 2nd Obstetric Clinic, out of 3 754 labouring patients only 105 had died, i.e. 2·7 per cent. Over a stretch of five years (1841–1846) the 1st clinic had witnessed 1 300 more victims of puerperal fever than the 2nd clinic.

These figures were only remarkable in the eyes of Semmelweis. All the doctors of the hospital knew about this, and so did the labouring patients who were mortally scared of being admitted to Klein's clinic. They did their utmost to evade the rule by which on certain days of the week women in labour were admitted to the 1st, and on other days of the week, to the 2nd clinic.

Semmelweis soon became convicted that the solution to the problem of puerperal fever lay in the difference between these figures and he was determined to find the reason behind the discrepancy. With unfailing energy he set himself to the study of all the case histories of the clinic and analyzed the statistical material from 1789, the year of its foundation, onwards.

He found out that puerperal mortality was very low, 1·25 per cent, up to 1822, when Prof. Lucas Johann Boer [25] had been director. Boer was a reformer of obstetrics in Austria, and believing in conservative treatment, had abolished purging and blood-letting methods then prevalent. He was of the opinion that labour was a normal physiological process: hence, the less interference from the obstetrician the better [26].

His successor, Prof. Johann Klein, introduced from the very first year of his professorship, from 1822, regular autopsy practice even for the midwife students of his clinic. At the end of this year the mortality figure in the maternity clinic had risen from 2·84 per cent to 7·45 per cent.

The 2nd clinic was founded after the division of the lying-in hospital into two clinics in 1833. Between 1833 and 1839, mortality among women in labour had been extremely high in both clinics. A definite change was noticeable, however, from 1840 onwards, when the 1st clinic was made available for the instruction of the medical students only, whereas the 2nd clinic was open to midwife students only. From then on difference in the mortality rate in the two clinics became obvious. This is evident from the table below.

	1st clinic	2nd clinic
1839	5·5 per cent	4·5 per cent
1840	9·5 per cent	2·6 per cent
1841	7·80 per cent	3·52 per cent
1842	15·8 per cent	7·59 per cent
1843	8·95 per cent	5·98 per cent
1844	8·23 per cent	2·30 per cent
1845	6·90 per cent	2·03 per cent
1846	11·44 per cent	2·79 per cent

Neither Prof. Klein nor the medical circles he represented had been impervious to the sufferings and tragedy of the women in labour. They had experimented with all possible treatments, but as all had failed, Klein, like the continental physicians in general, had reconciled himself to the idea that the disease was fatal. This attitude of Klein's no doubt explains his mistrust at seeing Semmelweis engaged in activities which seemed to defy the dictates of fate. On the other hand, Klein

was deeply concerned because he felt that the statistical material collected by Semmelweis was throwing adverse light on his clinic. It must have been very unpleasant for him to see that Semmelweis had proved categorically that the mortality rate in December 1842 had exceeded 31 per cent.

The professor was not impressed by the passionate zeal his young assistant had displayed in the question of puerperal fever. This sometimes carried him away to such an extent that a behaviour like that between professor and assistant can be described as unusual. In 1846, for instance, a commission had been sent out to investigate the question of high mortality in the 1st clinic and at the final discussion the professor had referred to a factor which, to his mind, must have, at least in his clinic, contributed to the outbreak of puerperal fever. This was the bad condition of the walls. Semmelweis rose to speak and contradicted his professor, saying that in many maternity hospitals the condition of the walls was still worse, yet fewer women died of puerperal fever than in the 1st Obstetric Clinic of the University of Vienna.

Day and night Semmelweis was haunted by a determination to solve the mystery of puerperal fever. Not for a moment did he stop worrying about the dreadful fate of labouring women, filling him first with uneasiness, and later with a sense of revolt in face of the helplessness of medical science. "A feeling of discouragement had taken possession of me", he said in his book, "really and truly I would have preferred to die. The puerperal disease remains a mystery, only the number of the dead is a palpable fact".

Markusovszky who was a surgical student in Vienna at that time, and who shared rooms with Semmelweis, recorded [27] how Semmelweis was tormented by his own impotence and the uselessness of medical science. "Thanks to his kindness, I was sharing rooms with Semmelweis", says Markusovszky "I had the chance of seeing him, both in the hospital and at home,—his watchful restlessness, his eagerness to examine people and conditions, his prying eyes trying to penetrate into the murderous disease, his zest to discover its cause. He had left nothing unexplored. Semmelweis had examined the new patients coming into the clinic most thoroughly, as regards their past history and present condition. He prescribed their diet and occupations, carrying on examinations and operations most carefully, arranging their places, making women in labour lie on their side, as was the habit in the 2nd clinic. After delivery they were carried to the wards so that they should not be compelled to walk as heretofore. He changed the administration of their drugs and by tactful strategics he kept away from dubious cases the professor himself, because he did not examine his patients gently enough. He had watchmen at the doors to prevent healthy well-to-do patients from being lured by midwives to the 2nd clinic. At the same time he made friends with the doctors of the same hospital so as to be able to watch conditions. He made doctor Lautnerbey, the head of the pathological anatomy department, keep records of all who had died in the hospital. He devoted special care to cleanliness and ventilation and even persuaded the clergyman to administer the Last Sacrament to the dying by going straight to the bed without making a detour in the hospital. All in vain!

The death bell kept ringing in spite of all precautions and was a painful reminder to the researcher and deeply distressed the great humanist."

Markusovszky's remark that Semmelweis made the labouring women lie on their side as in the 2nd clinic clearly proves that he was trying to find the factor involved in the difference in mortality between the two clinics. He had taken and weighed all the theories on the causes of puerperal fever. The hospital being overcrowded and obsolete, the poverty of the patients, inadequate food, bad ventilation and direct contact with the General Hospital were all conditions affecting both clinics in the same way. If telluric, atmospheric and cosmic conditions were at work, were they not the same in both clinics? Neither could they be the causes of epidemic outbreaks of the fever in one hospital only. There were others who believed that the excitement caused by the Catholic priest coming along the wards of the 1st clinic, with full attendance and the ringing of bells might have ill effects, while in the 2nd clinic, where each ward had a separate entrance, the patients were not frightened to death by this sight. Semmelweis had not given credence to this belief, but not wishing to leave anything unexplored, he begged the priest to enter in a roundabout way, and call on the dying without ringing his bell. The mortality rate, however, was not reduced by this precaution either. There were others again who discovered that the medical students were very rough in their examinations. According to Semmelweis the trauma caused by labour was still worse than mishandling, yet each labour has not ended in death. Nevertheless he tried to keep away from the women in labour those medical students who were supposed to be rough in their examination. Against his conviction, he agreed that the labouring woman should lie on her side, as was customary in the 2nd clinic. Yet none of these factors had changed the situation.

Little by little it dawned on Semmelweis that there had to be some connection between childbed fever and what was a common practice at the clinic: Namely, the doctors of the clinic regularly dissected the cadavers of those who had died in child labour the previous day and immediately afterwards, without washing their hands, or just washing them perfunctorily under the tap with a little soap, they went on examining the labouring patients.

Semmelweis had come to realize what had been left unnoticed so far, that is that the pathological findings in the cadavers of the mothers and in their new-born babies were identical. The same changes had been observed on the peritoneum, in the viscera, and the same symptoms of inflammation in the organism. He had naturally come to the conclusion that the identical pathological symptoms must have identical causes, that is, the babies had died of the same disease as their mothers—pyaemia. Since not only childbed patients can contract childbed fever and die of it, childbed fever—he argued—cannot be considered the specific disease of childbed patients only.

Semmelweis had reached this point in his observations when, without any previous warning, on October 20th, 1846, he was removed from his post as lecturer. The pedantic Professor Klein who had disliked the passionate Hungarian from the start, because he went his own way, managed to make the clinic prolong the

employment of Franz Breit—Semmelweis's predecessor—as a lecturer for another two years. Semmelweis was thus left without a job.

After eight months of feverish restlessness he left the clinic a worn-out and tormented man. The blow came to him at the worst time. A little earlier he had lost his beloved father and suffered much from the loss. He wanted to study obstetric methods in the great lying-in hospital of Dublin and began to learn English. Soon, however, he had an opportunity of being reinstated in his post because Dr. Breit who had held it was appointed to the chair of midwifery at the University of Tübingen. Before resuming his duties, at the suggestion of Markusovszky and in his company, he set out for Venice on March 2nd, 1847, in his own words "in order to refresh his depressed spirits very much tried by the events in the clinic" [28].

He returned to Vienna on March 20th, 1847, and resumed his duties at the 1st clinic for a period of another two years. In Vienna he heard the sad news: Prof. Kolletschka, the man who had shown so much kindness to him, Rokitansky's student, the professor of forensic medicine, was dead! During an autopsy his finger had been cut by a medical student's knife. The seemingly insignificant wound became septic and killed Kolletschka.

When reading the record made at Kolletschka's post mortem, Semmelweis was deeply shocked: The findings were identical with the symptoms of those who died in puerperal fever: peritonitis, phlebitis, multiple abscesses in the whole body that is to say, pyaemia.

"Still more agitated by the report of Kolletschka's death", writes Semmelweis, "there was forced upon my mind with irresistible clarity in this excited state the identity of this disease, from which Kolletschka had died, with that from which I had seen so many hundred puerperae die. When puerperae died they likewise had phlebitis, lymphangitis, pyaemia and metastases were also formed in them" [29].

The fact that after his injury, Kolletschka had developed identical symptoms and pathological changes as seen in the puerperal patients and their cadavers, had confirmed Semmelweis's belief that there must be some connection between the two cases. In fact, there must be a connection between the physicians' examining child-bed patients after dissections and puerperal fever itself! Now the explanation flashed to his mind: puerperal fever is caused by the examining physician himself, by the manual introduction of cadaveric particles into the wounded genitalia of their patients!

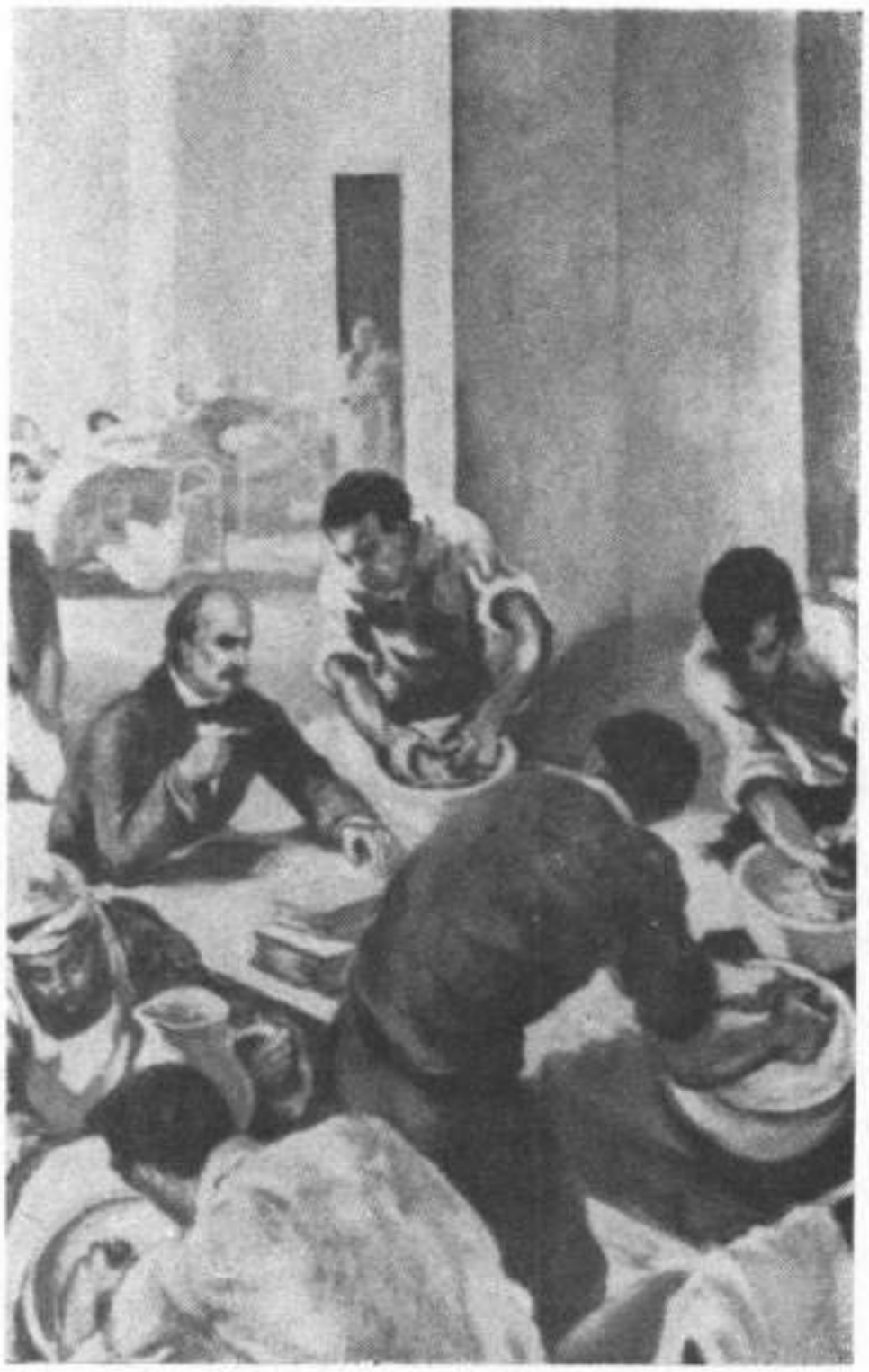
It was all so very clear now!

The 2nd clinic had been engaged since 1839 in the instruction of midwife students only. They were not doing post mortem examinations as were the medical students of the 1st clinic. Hence the discrepancy in the mortality of childbed patients after 1840.

The disease itself, and subsequent death was more frequent in hospitals, and also after prolonged deliveries because an internal examination was necessary more often in these cases. At home and after quick deliveries there was no oppor-

tunity of infecting the patients with cadaveric material clinging to the fingers. Here, too, was the reason why the anatomic picture of the deceased newborn was the same as that of the mother, because it was she who transferred the infection!

Later Semmelweis formed a team with Dr. Lautner, lecturer at Rokitansky's institute, to experiment on animals in order to prove the aetiology of puerperal fever and his discovery. They introduced infectious material from the uteri of puerperal patients into the vagina and uterine cavity of female rabbits which had just cast their litters. Later they infected the animals with blood and exudates from cadavers who had died of various diseases. In seven cases out of ten the experiments ended in positive results: the pathological changes in the animals that died were similar to those found in pyaemic human cadavers. In his book which is now among the classics of medicine, Semmelweis gives a full account of these experiments.



Semmelweis introducing antisepsis. Mural in the Medical Museum of the International College of Surgeons in Chicago (by Calvi di Bergelo, 1953)

Semmelweis himself was perfectly aware of the importance of his discovery. It is typical of the human greatness of this man to find that instead of being proud of it, he was filled with remorse, and reproached himself for what he had done before: "My conscience tells me that I must reprove myself, as God only knows the number of those who have died as a result of my activity. Few of the obstetricians have had more dealings with cadavers than myself . . . However painful and distressing this fact is, there would be no sense in denying it. No, there is one remedy only: to publish the truth to all those who are concerned" [30].

The course to be taken was obvious to him: as the doctors' hands carried the "cadaverous matter", they had to be properly cleaned before examinations.

The poison could be removed from the doctors' hands only by a thorough wash. But how could one make sure that the fatal poison was wiped away from the hands? He approached the question in an indirect way: after an autopsy the doctors' hands retained a peculiar smell, even after a handwash. He believed that

the smell came from the "poisonous materials", and hands could only be deemed clean if it did not cling to them anymore. After the morning post mortems he began to experiment with various solutions for handwash, till finally he decided on the chlorine solution.

Chlorinated lime for disinfection had been used before Semmelweis by Eisenmann and Holmes. Semmelweis mentions it in his book: "The English had for some time regarded puerperal fever as a contagious disease, applying chlorine washings for prevention" [31].

In 1832 the use of chlorinated lime was suggested also at the medical faculty of Vienna [32].

When he was certain of the truth of his discovery, he told Professor Klein about it in the following words: "Puerperal fever is caused by cadaveric particles adhering to the hands of the physician who examines the childbed patients; thus it is of utmost importance that he should clean his hands properly before a visit, for which purpose I advise the chlorine solution."

The animal experiments mentioned were continued but Semmelweis did not wait long before offering practical measures following from the theory. At the end of May 1847 he made it compulsory for all physicians and medical students performing dissections to disinfect their hands before an examination.

The introduction of the chlorine handwash had given rise to protests. Even the medical students tried to refuse to comply. Professor Klein himself was not convinced of the importance of the discovery, and was slightly worried by the "whims" of his "over-ambitious" young Hungarian assistant. Nevertheless he approved of the introduction of the handwash and complied with it himself, hoping probably that the theory would soon be contradicted by new facts, as had happened in the case of various other, busybody reformers.

Semmelweis did not and could not know at the time that the chlorine handwash and the application of a nailbrush after the use of soap destroyed not only the smell, but also the bacteria clinging to the skin. The chlorine handwash with the nailbrush had inaugurated obstetric antisepsis.

Semmelweis himself has made no mention of the use of the nailbrush, but there are direct and indirect references in literature to prove that Semmelweis introduced not only the use of chemical but also that of mechanical disinfection into obstetric practice.

The introduction of the chlorinated lime handwash produced amazing results. The mortality rate was greatly reduced, in April being 18·27 per cent, in May, 12·24 per cent, in June 2·38 per cent, and by the end of the year 0·19 per cent. For the year 1848 the mortality in the maternity section was 1·27 per cent, from a total of 3 356 childbed cases only 45 dying in childbed fever. For the first time since 1840, the death rate in the 1st clinic was lower than in the 2nd clinic, 1·27 per cent, against the latter's 1·33 per cent. In March and August of 1848 there were no deaths in the clinic.

On childbed fever mortality at the University of Vienna clinics before and after his discovery Semmelweis published the following statistical table in his book:

	1st (medical) clinic	2nd (midwifery)
1833–1839	62·2	57·3
1840–1846	97·6	38·3
1847–1861	33·1	29·2

out of 1 000 childbed cases.

So the difference in mortality in the two clinics became negligible after the discovery.

After the introduction of chlorine washings the mortality rate dropped so much that Semmelweis had every reason to believe that according to his theory childbed fever and pyaemia were identical. But he did not have much time for rejoicing. After the month of August, when there had been no deaths among the patients, in September and October mortality had risen again to 5·2 per cent, and 3·9 per cent, respectively. In the beginning Semmelweis thought that something must have gone wrong with the disinfection, causing a new outbreak. It soon turned out, however, that two patients, one suffering from purulent uterine cancer, the other from a carious knee-joint, were responsible for the ravages of the new epidemic by infecting the patients through their exudates.

Owing to this incident Semmelweis gave a definite wording to his theory: Not only cadaverous particles could produce puerperal fever, but any putrid organic material, any putrid exudate of the living organism if introduced into the genital organs of labouring woman by the hand of the examining physician, and entering into the blood stream.

Puerperal fever can by no means be regarded as a specific disease, like smallpox, erysipelas, scarlet fever, etc. and does not spread by the intermediary of a specific contagion. Puerperal fever is caused by a septic wound, and is one kind of pyaemia, brought about by contact with an infectious agent, specifically by some putrid particle attached to the finger of an examining doctor, and subsequently introduced into the blood stream.

Semmelweis, with his definition had put his finger on the basic misconception of the so-called contagionists. In an article written in 1860 he discussed the difference between his doctrine and that of the contagionists. "I do not consider puerperal fever a contagious disease, since it cannot be carried over from a puerperal patient to a healthy person, and since the disease may be caught from persons other than a puerperal patient." A person infected with smallpox can produce smallpox in any healthy person, and a healthy person can be infected by smallpox only through the medium of a patient suffering from smallpox. No one had caught smallpox so far from a patient suffering from cancer of the womb.

"The situation is entirely different with regard to puerperal fever. If the puerperal patient does not produce any putrid material, there is no agent to carry the disease from one person to another; if, on the other hand, putrid material is produced, as in the case of endometritis septica, then puerperal fever may infect any healthy person. From a puerperal cadaver puerperal fever may be carried

over, depending on the putrid state of the cadaver; puerperal fever, on the other hand, may develop when caused by other diseases, as putrid erysipelas, cancer of the womb, etc. Whatever illness has caused death, any cadaver may produce puerperal fever, depending on the state of putrescence.

"Contagious diseases can only spread by means of the agent that produced them. Caries has never been the cause of a smallpox epidemic. Puerperal fever, on the other hand, is not the exclusive cause of the same, and the agents of various diseases may be responsible for its outbreak" [33].

Semmelweis gave the clearest possible definition to his doctrine, making it quite plain that puerperal fever was the ultimate result of a septic wound. Any portion of the genital tract may become susceptible to the infecting agent causing sepsis. Semmelweis had replaced mysterious notions like "miasma", "contagion", etc. by the agent of "putrid, organic, animal material" in the aetiology of the disease. The existence of this agent makes it obvious that there is a direct connection between the infection and the putrid, septic process.

The scientific explanation came much later, when Pasteur identified the bacteria as the real cause of puerperal fever, after having found streptococci in the blood stream of the affected [34]. It was left to him and to other bacteriologists to produce the final evidence in support of Semmelweis's brilliant theory of a concrete infecting agent, substituting then the notion of "putrid, organic, animal material" by concrete bacteria. Without any knowledge of the latter, Semmelweis formulated his doctrine of endogenous and exogenous infection when building up his theory concerning the aetiology of puerperal fever.

Not a Chance Discovery

The momentous discovery of Semmelweis was the triumph of logical thought. Before formulating his theory he had engaged in extensive clinical, anatomical and statistical studies even doing animal experiments in order to prove his theory [35]. Nevertheless some of his contemporaries maintained that he had been led to his discovery by luck, and his enthusiastic statement after having read the Kolletschka report might have given that impression. There is no doubt, on the other hand, that the Kolletschka autopsy report did give the final impetus to convince him to formulate his theory, but nothing more. Had he not already made serious observations based on his experiences in the study of puerperal fever in its many aspects, the Kolletschka post mortem report would have meant nothing to him. And actually it did not mean much to his colleagues—clinicians and pathologists alike—working with or without him in the intricate clinical and anatomical study of pyaemia. The discovery of Semmelweis was not a "matter of chance", said Markusovszky, "but a conviction, deeply rooted in science".

There were many other medical discoveries in the nineteenth century, but most of these were achieved through the technical help of the new natural sciences. In his discovery Semmelweis received no help from external factors, but it was the culmination of deep clinical observation combined with logical reasoning.

"How was it possible", said Bäcker, "that without the vast assistance of modern technical aid, Semmelweis was able to make his discovery, far in advance of his time? The only satisfactory answer to the question is: His great clinical knowledge! That was the only weapon of his highly developed brain". Pertik again insists on Semmelweis's tremendous perspicacity: "He had a penetrating mind, capable of analyzing the immense data of the statistical tables of all the European lying-in hospitals, in order to prove his point, to smash the arguments advanced in favour of the supposed causes of puerperal fever. His was a brain far above the average, governed by a desire to find the truth, at whatever cost" [36].

That is the whole truth. Yet we must add that apart from his personal qualities, he also had at his disposal technical and scientific aid, which at that time was only available in Vienna, among all the cities of the Austro-Hungarian Monarchy. These were as follows: In those days pathological anatomy flourished in Vienna and Rokitansky allowed Semmelweis to pursue any studies he liked, and he availed himself of this opportunity, day and night. A great maternity ward with all its patients was at his disposal. All the maternity statistics from 1789 onwards were open to him. There were two lying-in clinics working under similar conditions at his disposal for comparison, and finally, Professor Skoda's *per exclusionem* diagnostic method, from which Semmelweis had a chance to learn, helped his logical mind to develop [37].

Last but not least, the discovery was the achievement of a man with a deep clinical power of observation, scientific honesty, and expert knowledge, who could turn local conditions to advantage and combine all his faculties with his deep sympathy with the suffering women of the world. Whatever his merit, Semmelweis discovered the aetiology of a devastating disease, he prescribed ways and means for its prevention, in itself unprecedented in the history of medicine.

Notes

1. Schürer von Waldheim, op. cit. p. 7 (cf. Chapter I, Note 35).
2. *The Complete Works of Semmelweis.* (Budapest, 1906) p. 129.
3. C. Th. K. Litzman, *Das Kindbettfieber in nosologischer, geschichtlicher und therapeutischer Beziehung.* (Halle, 1844). Here the author discusses previous views concerning the aetiology of puerperal fever, with a review of puerperal epidemics until 1841. A. Hirsch speaks of 218 puerperal epidemics until 1854. *Handbuch der historisch-geographischen Pathologie.* 2 vols (Erlangen, 1862–1864).
4. Th. Willis, *Opera omnia.* (Amstelodami, 1662). Ch. 16 *De puerperarum febribus.*
5. D. Sennert, *Opera omnia.* (Venetianae, 1641).
6. H. Boerhaave, *Commentarii in Herm. Boerhaave aphorismos de cognoscendis et curandis morbis.* (Lug-Bat., 1764).
7. F. Platter, *De ventris doloribus.* (Basel, 1612).
8. N. Hulme, *A Treatise on the Puerperal Fever, wherein the Nature and Cause of that Disease so Fatal to Lying-in Women are Represented from a New Point of View, Illustrated by Dissections, and a Rational Method of Cure Proposed, Confirmed by Experience.* (London, 1772) p. 175. The book was translated into German in the same year, *Abhandlung von dem Kindbettfieber.* (Leipzig, 1772).

9. C. Pouteau, *Mélanges de chirurgie.* (Lyon, 1766).
10. Th. Helm, *Monographie der Puerperalkrankheiten.* (Zürich, 1839); F. Schuch, Einige Worte über das Puerperalfieber. *Allgemeine Medizinische Zeitung* (1838) p. 45.
11. Ch. White, *A Treatise on the Management of Pregnant and Lying-in Women and the Means of Curing, but More Especially of Preventing the Principal Disorders to which They Are Liable. Together with Some New Directions Concerning the Delivery of the Child and Placenta in Natural Births.* (Illustrated with cases. London, 1773).
12. Th. Denman, *Introduction to the Practice of Midwifery.* (London, 1782).
13. A. Gordon, *Treatise on the Epidemic of Puerperal Fever in Aberdeen.* (Aberdeen, 1795).
14. O. W. Holmes, *On the Contagiousness of Puerperal Fever.* (April, 1843). Here the author discusses the contagious nature of puerperal fever and the methods of prevention. Cf. John T. Morse jun., *The Life and Letters of Oliver Wendell Holmes.* (London, 1896).
15. O. W. Holmes, *Puerperal Fever as Private Pestilence* (Boston, 1855). Cit. by J. W. Sinclair, The Discoverer of the Aetiology of Puerperal Fever. *Lancet* (1907) p. 324.
16. John Howard (1726–1789), English philanthropist, complains about the dreadful state of hospitals and nursing at that time. Cf. *Nachrichten von den vorzüglichsten Krankenhäusern in Europa.* (Leipzig, 1791).
17. K. G. Carus, *Lehrbuch der Gynaecologie.* (Wien, 1829) part II, p. 502.
18. D. W. H. Busch, *Das Geschlechtsleben des Weibes.* (Leipzig, 1843) vol. IV, p. 865. There is also a summary, pp. 918–923, concerning puerperal fever.
19. F. W. Scanzoni, Bemerkungen über die Genesis des Kindbettfiebers. *Prager Vierteljahrschr.*, vol. 4 (1846) p. 18, "*. . . welche, wenn sie sich zu einem höheren Grade steigert, die nächste Entstehungsursache und folglich das Wesen des gemeinen Puerperalfiebers darstellt.*"
20. P. G. Cederschiöld, Professor of Obstetrics in Stockholm. In his work of 3 vols published in 1836–39, he discusses preventive measures to puerperal fever. Cf. Hauch, *Gynécologie et Obstetrique*, vol. VIII (1928). S. Kneeland, On the Contagions of Puerperal Fever and its Connections with Epidemic Erysipelas. *American Journal of Medical Sciences* (*Philadelphia*) (1846) pp. 324, 457.
21. Sir Th. Watson, President of the Royal College of Physicians. *Lecture on the Principles and Practice of Physics.* 2 vols (London, 1844).
22. A. Trusseau, *Clinique Médicale de l'Hôtel Dieu de Paris* (Paris, 1839).
23. G. Eisenmann, Die Wundfieber und das Kindbettfieber. *Die operativen Krankheiten und die entgiftenden Heilmethoden.* (Erlangen, 1837).
24. "*. . . Die ganze Lehre von den Kindbettfiebern sich auf die Lehre von der Infektion und Verderbnis der Wunden stützt.*"
25. L. J. Boer, *Abhandlungen und Versuche zur Begründung einer neuen, einfachen und naturgemässen Geburtshilfe.* (Wien, 1810).
26. In 1941 Burgess makes mention of Boer, who, according to him, introduced the prophylactic, obstetric method of Charles White of Manchester in Vienna.
27. *Collected Works of Lajos Markusovszky.* Ed. by Gy. Marikovszky (Budapest, 1905) p. 285.
28. Semmelweis, *Collected Works.* p. 115.
29. Semmelweis, A gyermekágyi láz kórtana (The Aetiology of Childbed Fever). *Orvosi Hetilap* (*Medical Weekly*) (1858). Semmelweis, op. cit. p. 33.
30. Semmelweis, op. cit. p. 124; pp. 132–136.
31. Semmelweis, op. cit. p. 292.
32. Die Fähigkeit des Chlorkalks zur Zerstörung von Contagien, Hintenhaltung des Fäulnis animalischer Substanzen und der Leichname, Reinigung der Luft usw. *Medizinische Jahrbücher des k. k. österreichischen Staates* (1832) p. 89.
33. Semmelweis, A gyermekágyi láz fölötti véleménykülönbség köztem és az angol orvosok között (Where I Disagree with English Physicians on Puerperal Fever). *Orvosi Hetilap* (*Medical Weekly*) (1860) pp. 44–47; idem, op. cit. p. 68.
34. The existence of bacterial organisms had cropped up time and again throughout the nineteenth century. Agostino Bassi (1773–1856), Italian physician of Lodi, discovered in

1835 that Botrytis Bassiensis, a living organism, caused lime deficiency in silkworms. Bassi pointed out the parasitic origin of human diseases and outlined the idea of bacteriological infection: "*Mentre si credeveva, e si crede moltissimi, per non dire da pressoche tutti i sapienti, essere i contagi sostanze di un genere loro proprio sono invece sostanze vive specie, cioe, di parasiti animali o vegetali.*" (Many scientists, practically all, believe that an epidemic is caused by a specific agent, although they are living beings, plant or animal parasites.) Abruzesse, Le causa dell' infezioni nel parto. *Rivista di storia delle scienza mediche e naturali* (1949) pp. 115–139. Theodor Schwann (1810–1882) discovered the animal cell and stated that putrescence is caused by microscopic living organisms. Cf. *Mikroskopische Untersuchungen über die Übereinstimmung in der Struktur und dem Wachstum der Thiere und Pflanzen.* (Berlin, 1839). F. J. Henle (1809–1885), anatomist, brought into close proximity the living microbes whose existence was suspected by Girolamo Frascatoro and Bassi, also ascribing infectious diseases to parasitic origin. He clearly demonstrated that infection could not be caused by chemicals, but only by living matter capable of multiplication, with a separate life of its own, acting within the sick body as a parasitic organism. "Parasitic organisms", writes Henle, "are the lowest and smallest beings on the scale, and certainly with the greatest propensity to multiply". Cf. *Pathologische Untersuchungen von den Miasmen und Kontagien.* (Berlin, 1840). L. I. Schönlein (1804–1881) demonstrated in 1838 that the skin disease called favus was caused by a living fungus, which was later to be called Achorion Schönleini.

35. E. F. Podach, Zur Geschichte der Semmelweisschen Lehre. *Zeitschrift für Geburtshilfe und Gynaecologie* 129 (1948) pp. 59–61.
36. J. Bäcker, Semmelweis emlékezete (In Memoriam Semmelweis). *Gyógyászat* (*Medical Practice*) (1919) p. 23. Petrik, In Memoriam Semmelweis. *Orvosi Hetilap* (*Medical Weekly*) (1888) pp. 209–210.
37. E. Lesky, Die Wiener geburtshilflich-gynaekologische Schule, Geist und Leisung. Lecture delivered 4th Sept. 1961 at the 3rd Congress of International Federation of Gynaecology and Obstetrics. Vienna.

Chapter Three

The Discovery and the Contemporaries

First references to the Semmelweis discovery — Semmelweis's participation in the Vienna Revolution — End of his appointment at the clinic — Skoda lecturing on Semmelweis's discovery at the Academy of Sciences of Vienna — Semmelweis addresses the Medical Society of Vienna — Close of Vienna period

First References to the Semmelweis Discovery

With the "puerperal sun" rising in Vienna [1] the discovery had inaugurated obstetric prevention.

Semmelweis, though fully conscious of its significance, did not strive for personal recognition, and neither ambition nor a desire for distinction was part of his psychological make-up. At the beginning his only aim had been to relieve the pains of the mothers in his own section of the hospital, and he had not considered the implications of his discovery from the point of view of the world. But as time passed, he became more and more aware of the importance of his discovery, and he himself said that it was equivalent to Jenner's. Numerically speaking, his prophylaxis if used everywhere could save as many human beings as vaccination. He was quite sure that his doctrine, with its tremendous practical benefits, would need no special recommendation to win over the medical world. He still had to learn that it is not enough to discover the truth, one has to get it accepted, which is even more difficult.

To begin with, his immediate chief, Professor Klein had given him little support. In 1846 already, when Semmelweis was lecturer for the first time, Prof. Klein had tried to get rid of him, and later, when Semmelweis made his discovery Klein made his lack of interest perfectly obvious. Adolf Kussmaul, who stayed in Vienna when Semmelweis was building up his theory, has the following to say on the matter: "Klein showed no interest whatsoever in the work of his assistant. The great leaders of the young Vienna school, Skoda and Hebra, recognized the importance of Semmelweis's endeavours and helped him whenever they could, Klein, on the other hand, was a stumbling block, not so much because he wanted to oppose him, but for sheer lack of understanding" [2].

Nevertheless, the doctrine had started to spread, soon after its discovery, both in Vienna and abroad. In Vienna it was Prof. Ferdinand Hebra, the famous dermatologist, who for the first time acquainted the public with the discovery. Without Semmelweis's knowledge and help, he sent the following editorial to the journal of the Medical Society of Vienna, which appeared in December 1847,

entitled: "Experience of the Highest Importance Concerning the Aetiology of Puerperal Fever Epidemics at Lying-in Hospitals."

The Editors of this Journal feel it their duty to communicate to the medical profession, in view of the prevalence of puerperal fever in all lying-in hospitals, the following observations made by Dr. Semmelweis, Lecturer at the 1st Obstetric Clinic in the General Hospital of this city.

Dr. Semmelweis, who has been for five years at the hospital, has become thoroughly acquainted, at the dissection table as well as at the beds of the patients, with the various branches of the art of healing. For the last two years he has devoted special attention to the subject of midwifery, and has undertaken the task of inquiring into the causes which lie at the basis of the prevailing epidemic puerperal processes. On the subject nothing had been left untested, and everything that could exercise an injurious influence has been carefully removed.

By daily visits to an institution of pathology and anatomy Dr. Semmelweis learnt about the injurious influences produced by filthy and putrid fluids even on unwounded portions of the body of individuals engaged in post mortem examinations. These observations aroused in him the thought that perhaps in lying-in hospitals the pregnant and parturient patients were possibly contaminated by the accoucheur himself, and that puerperal fever was in most cases nothing else than cadaveric infection.

In order to test this opinion, it was laid down as a rule in the 1st Obstetric Clinic that everyone, before making an examination of a pregnant woman, must first wash his hands in an aqueous solution of chloride of lime (*Chlor. calcis unc. 1, Aquae fontanae libras duas*). The result was surprisingly favourable; for during the months of April and May, when this rule had not yet been introduced, out of 100 cases of labour there were 18 deaths; the number of deaths in the following months up to November only amounted to 47 out of 1 547 cases, that is to say a 2·45 per cent mortality.

From this circumstance we can now perhaps see why in schools for midwives the prevalent mortality rate is so low in comparison with that of the institutions devoted to the training of students of medicine. An exception is the *Maternité de Paris*, where, as it is well known, post mortem examinations are made by the pupil midwives.

Three distinct facts derived from experience may perhaps still further confirm the conviction just expressed and even extend its scope. Dr. Semmelweis believes he can prove that:

1. Owing to careless washing, some students engaged in dissection caused the loss of several patients in the month of September;

2. In the month of October, owing to frequent examinations of a patient in labour, who suffered from an ichorous medullary sarcoma of the uterus, when washing was not scrupulously practiced, and finally:

3. Owing to unclean discharge from an ulcer of the leg in one of the patients, several women who were confined at the same time became infected.

Therefore, the conveyance of foul exudate from a living organism may be one cause which produces the puerperal process.

In publishing these experiences we invite the Directors of all the lying-in institutions, some of whom Dr. Semmelweis has already informed about these most important observations, to contribute the results of their investigations either to support or to refute them" [3].

Hebra was blamed that the article quoted could be misunderstood partly for calling puerperal fever an epidemic disease and partly for writing that the infection could start from an unwounded skin. Apart from the latter insignificant mistake Hebra clearly points out that according to Semmelweis cadaveric infection is not the only aetiological factor to cause puerperal fever and that other ichorous exudates of the living organism may also be responsible.

In 1847 Rokitansky also made a statement accepting the overwhelming logic of Semmelweis's discovery. Rokitansky, who in his basic work published in 1842–1846 had been an adherent of the crasis doctrine [4], abandons this theory of the aetiology of puerperal fever in the second edition of his book [5].

As Rokitansky's attitude and Hebra's article failed to produce the expected reaction, Hebra, in April 1848, in a second article entitled: "Further Experiences Concerning the Aetiology of Epidemic Puerperal Fever in the Lying-in Hospital" calls upon the hospitals to try out the chlorine handwash, recommended by Semmelweis, and to collect their observations on the matter. He mentions Michaelis and Tilanus, and their favourable reactions, and speaks of the Semmelweis discovery as deserving to be compared to that of Jenner's.

In the December 1847 issue of this Journal a report appeared on the highly important experience of Dr. Semmelweis, lecturer at the 1st Obstetric Clinic, with regard to the causation of the epidemic puerperal fever which occurs in lying-in institutions.

This experience consists (as the readers of this Journal will remember) in what follows: the lying-in women become ill especially when they have been examined by medical men who have soiled their hands by examinations of dead bodies, and had washed them only in the usual way; whereas no cases of illness, or very few, have occurred when the examining doctors had first washed their hands in an aqueous solution of chloride of lime.

This important discovery, which is worthy ranking beside that of Jenner's smallpox vaccination, has not only received complete confirmation in our lying-in hospital, but assenting voices have been raised in distant foreign lands expressing belief in the correctness of the theory of Semmelweis. Among the letters received are those from Michaelis of Kiel and Tilanus of Amsterdam, with corroborative testimony to which I refer here. Still, in order to obtain for this discovery its full effect we wish, in a most friendly manner, to request all the directors of lying-in hospitals to institute investigations and to send the results obtained to the Editor of this Journal irrespective of whether they support or refute the theory [6].

When Semmelweis was working on his theory, Vienna was frequented by a great number of foreign physicians among whom he was extremely popular. Among those who referred to Semmelweis in the most cordial terms was the above-mentioned Kussmaul, who from a distance of fifty years spoke with affection of the warm-hearted, hard-working obstetrician, and kind friend. Among the names of the benefactors of the world, says Kussmaul, Semmelweis's must be mentioned next to that of Lister. He noted objectively that while Lister was able to use the advantage of the great discoveries of Pasteur, Semmelweis had nothing else to go upon but his own observations and pathological findings. In his recollections Kussmaul pays tribute to the great man: "Among my friends in Vienna there are few I remember with more love and gratitude than Semmelweis. When we became acquainted he had just made his marvellous and beneficial discovery for which mankind has so much to thank him. The excellent man had worked day and night on the problem, discussing it also with us in our daily intercourse" [7]. A Swiss doctor, Jakob Laurenz Sonderegger, remembers similar

experiences in his memoirs. In the autumn of 1848 he attended Semmelweis's courses in obstetrics. He writes that Semmelweis, the keen observer and splendid teacher, was greatly appreciated by foreign students who thought highly of his lectures. He was present when Semmelweis discovered that the examining physicians' hands could be responsible for the high mortality of patients dying of puerperal fever. He immediately introduced the compulsory chlorinated lime handwash with the combined use of the nailbrush. As a result of these measures the mortality rate was drastically reduced, falling within a few weeks to 9·5 per cent and subsequently to 1 per cent. Sonderegger called Semmelweis the John Huss of epidemiology [8].

The foreign doctors in Vienna soon informed friends and relatives by letter about the events in Vienna. Hermann Schwartz, assistant obstetrician of Kiel, informed his chief, Michaelis, director of the lying-in hospital at Kiel, about every detail of the discovery, in a letter written December 21st, 1847. Michaelis replied on March 18th, 1848 that chlorine handwash had been made compulsory there, and the results had proved in every respect Semmelweis's discovery.

Poor Michaelis! He blamed himself bitterly for the death of a beloved relative whose delivery had taken place a few weeks before he was informed about Semmelweis's doctrine and practice and who had died of puerperal fever. He was tortured by undue remorse to such an extent that on August 9th, 1848 he committed suicide.

Twelve years later, quoting the case of Michaelis in his book Semmelweis cannot refrain from adding that there were many others who cared little about the fate of those mothers who had been entrusted to their care. "I am quoting the example of Michaelis to pay tribute to his memory. Unfortunately there are other obstetricians who might have borrowed a portion from the over-scrupulousness of Michaelis. Let him rest in peace!" [9].

Among those who unselfishly supported the great cause, the name of Franz Hektor Arneth should be mentioned first. He worked at that time in the 2nd Obstetric Clinic, and describes Semmelweis's discovery in a letter addressed to a leading British obstetrician, Professor James Young Simpson (1811–1870) of Edinburgh [10]. Simpson answered the letter very discourteously, dismissing the Semmelweis theory as insignificant: there was nothing new in it, he declared, it was already known in Britain, anyhow, that puerperal fever was contagious, but it seems Semmelweis is not familiar with the medical literature of Britain. Simpson himself had not recognized the basic difference between the theory of the contagionists and that of Semmelweis, according to whom puerperal fever was not a specific contagious disease, but a form of pyaemia.

In March 1848, Christian Bernard Tilanus, surgeon of Amsterdam, replied favourably to a letter addressed to him by Dr. Stenrichs about Semmelweis's discovery. But his reply was not entirely unequivocal. He agreed on the effectiveness of the chlorine handwash and was ready to introduce it if needed; he agreed on the aetiological importance of cadaveric poisoning, but he had seen

no adequate reason to give up his former views concerning the periodic occurrence of puerperal epidemics caused by atmospheric influences.

Michaelis had sent Schwartz's report to Levy, Professor of Obstetrics in Copenhagen, who published a review, extremely critical, in the Danish *Hospital News* in 1848 [11], but which Semmelweis, on the other hand, had not seen before 1858.

M. Friedrich Wieger, lecturer at the University of Strasbourg, who was on a study tour in Vienna in 1848, had returned to France with the firm resolution of introducing the discovery of Semmelweis. He submitted an article on the subject to the *Union Médicale*, where the statistical findings of Semmelweis concerning puerperal mortality in the Vienna clinics are quoted with precision and where he endeavoured to refute arguments raised against the Semmelweis doctrine [12].

Among those who tried to popularize the Semmelweis theory in England was the young English obstetrician Henry Felix Routh who had been in Vienna at the time of the discovery and had become an enthusiastic follower of Semmelweis. On November 28th, 1848 he read a lecture before the Royal Medical and Surgical Society in London on the theory, which was published in the transactions of the Society in 1849, with an abstract in the *Lancet* of December 9th, 1848 [13].

While no one can doubt the sincerity of Routh's intentions to make the Semmelweis theory accepted in England, nevertheless he was somewhat responsible for it being misunderstood, since he had maintained that the Semmelweis doctrine confined itself exclusively to cadaverous poisoning as the source of infection [14].

Semmelweis's Participation in the Vienna Revolution

The revolutionary storm that swept across Europe in the spring of 1848 had reached Vienna in March, where it broke out on the 13th, two days before the Revolution in Pest. There had been constant riots and disturbances in the streets of Vienna, and the university was closed on March 26th.

The first onslaught of the revolution caused the fall of Metternich and with it, even though for a brief period, the order he had represented. For a short time following the resignation of the chancellor, the régime was in the hands of the partisans of progress. The new atmosphere had influenced the University, too. Since 1836 the affairs of the university had been managed by the faculty sub-director. The triumph of the revolution brought a change, and the new government made Ernst Feuchterleben (1806–1849), Professor of Psychology, a staunch advocate of freedom and progress, responsible for educational matters in the university.

In May the Academic Legion, the so-called *Burschengarde*, was formed, with 3 000–4 000 student members. The Academic Legion included five divisions: (*i*) medical students, (*ii*) law students, (*iii*) arts students, (*iv*) technical students, (*v*) college students with about 6 000 members altogether. The members of the

Legion wore a uniform: grey trousers, a tight blue jacket with black buttons and a wide-brimmed hat with a black feather. It was, however, disbanded on May 15th, owing to a new revolutionary movement.

The members of the Legion, although it was officially dissolved, continued to play an important role in the revolutionary events. They seized munition stores and had a part in the sabotage which prevented the imperial troups in Vienna from setting out to various destinations in Hungary, delaying them for months. Many Legion members joined the forces in Hungary and fought in Transylvania under General Bem [15].

Semmelweis is described by Schürer von Waldheim as having participated in the revolutionary events of March 13th, 1848. He is supposed to have taken part in the action which stormed the Viennese army ready to set out for Hungary on October 6th, 1848. "Semmelweis was one of the most passionate and active revolutionary fighters" says Waldheim [16].

Another former pupil of Semmelweis's, the Swiss Amsler, wrote in 1906 that Semmelweis, when lecturing to the foreigners in 1848, often appeared in uniform. "I made the acquaintance of Dr. Semmelweis in 1848, in the revolutionary days of March. In the company of German, Dutch, Swedish and English doctors we attended his courses in surgical obstetrics, and in those revolutionary days it often happened that Semmelweis appeared wearing the uniform of the National Guard of Vienna. The lectures were followed by informal talks. At the time, as Prof. Klein's lecturer he was engaged in the study of the aetiology of puerperal fever and in devising prophylactic measures for its prevention. He was enraged because the official circles did not want to accept his views. It was a great consolation to him that we, his pupils, believed in him and would propagate his teachings in our respective countries" [17].

Klein and the other reactionaries had been quick after the failure of the revolution to use Semmelweis's revolutionary behaviour to his discredit. Undoubtedly "revolutionary failings" had an adverse influence on the course of events in his later career [18].

Sinclair believes that the Vienna Revolution contributed to the failure of his academic career: "The political storm, about to burst upon Vienna, was to have a disastrous influence on the career of Semmelweis", says Sinclair. "Generally speaking, we read very little in the history of medicine about the influence of political events, in any epoch, upon the advancement or arrest of the progress of medical science; and in this particular instance, in spite of the serious consequences of the revolution upon the whole subsequent career of Semmelweis, we note with astonishment an almost universal silence on the subject among his biographers" [19].

The Revolution of Vienna was short-lived. The Hungarian army sent to the relief of Vienna failed to arrive in time owing to dissension among the commanding officiers, and the musketeers of Windischgrätz stifled the revolution of October 30th in blood. On November 1st, 1848, the black-yellow flag was hoisted again on the pinnacle of St. Stephen's in Vienna.

Many biographers dwell on his revolutionary activities, but it is not easy to see clearly in the light of the controversial sources. There is no doubt that Semmelweis, like the majority of his contemporaries, was enthusiastic about the cause of the Revolution of March 1848, wishing to see the end of imperial autocracy and the achievement of Hungarian independence. Many of his Hungarian friends were engaged in the revolutionary cause. On the other hand, in spite of lavish testimony quoted by his biographers, the name of Semmelweis cannot be traced among the members of the Academic Legion. His name figures, however, among the members of the civil corps, organized by Count Hoyos to maintain public order, the National Guard. This seems to be confirmed by Amsler's statement. There is little likelihood, however, that he played any active part in the second, October revolution of Vienna, for had he done so, he would have been an open target to his enemies. His career was adversely affected, on the other hand, by his participation in the reform movement of the university fighting for its autonomy against ministerial autarchy.

End of His Appointment at the Clinic

Whatever the effect of his political activities, the climate around Semmelweis had changed since the publication of his discovery. Certain circles looked on him with suspicion, and his chief in particular regarded him with displeasure as he became more and more jealous of his zealous lecturer.

In January 1849 Skoda submitted a proposal to the medical faculty that a commission should be appointed from among its own members "to investigate the practical value of the Semmelweis discovery in all its aspects and bearings and to consider the statistical material available concerning the two obstetric clinics".

At that time the reactionaries of the faculty had gained great influence. After the Revolution had been defeated, Feuchterleben was relieved of his post as deputy director of studies, and was succeeded by Anton Rosas, the leader of the bitter reactionaries. His friend Klein also had increased in influence [20]. Rosas who grudged the talent of the younger generation had always disliked Semmelweis.

The proposal split the faculty in two, with Skoda on one side, and Klein and Rosas on the other, who opposed the idea, so that when a great majority declared itself in favour of the commission, Klein requested the Minister of Public Education "to drop the proposal which was an attack on his personal honour". Today it would be inconceivable: Klein was successful in his appeal, which the Imperial Ministry approved without giving any reasons.

As far as Semmelweis was concerned, Klein's hostility had intensified because Karl Haller, the deputy director of the General Hospital, had brought the subject of the discovery before the Medical Society and Semmelweis had been requested to give a lecture on the subject to the pathological sub-committee of the Medical Society on February 23rd, 1849.

Karl Haller was among the warmest and most influential supporters of Semmelweis who fought for his doctrine. In the yearly report of the General Hospital he stressed the immense importance of the discovery from the point of view of general surgery. "The significance of this experience for lying-in hospitals, and for hospitals generally speaking, especially for the surgical wards, is so immeasurable that it appears worthy of the attention of all men of science . . ." [21].

This was too much for Professor Klein! He regarded the invitation of the Medical Society to Semmelweis to give an address as an insult to his authority both as professor and obstetrician, and he decided to get rid of Semmelweis, who a month later, on March 20th, 1849 was relieved of his position as clinical lecturer.

Semmelweis had intended to stay on at the clinic, and before the expiration of his appointment had asked for its renewal. His request received the support of the majority of the medical faculty, but Professor Klein rejected it with the flimsy excuse that lecturers' appointments in the obstetric clinic did not as a rule extend over one year.

Semmelweis appealed against Klein's decision through the dean's office of the faculty, asking for the renewal of his appointment, in order to continue his research work and complete his discovery. In his appeal, he referred to the circumstance that K. Braun appointed to succeed him on March 2nd, 1849, only spent two weeks at the clinic, a term insufficient to pursue his duties adequately for the benefit of the institution.

His request, endorsed by Klein and Rosas was naturally rejected by the Ministry. Klein testified that Semmelweis's autocratic action at the clinic had caused difficulties, and as far as the chlorine handwash was concerned, in full agreement with the head of the 2nd Obstetric Clinic, Prof. Bartsch, he declared in all competence that it had no practical value. Rosas supported Klein's opinion by adding that Semmelweis's departure from the clinic was desirable owing to the strained relations between him and Klein, which was harmful to the clinic. The excellent qualities of Karl Braun [22] were stressed to good advantage. Semmelweis was now not only left without a proper background to pursue his experiments, but he had lost his very livelihood.

Semmelweis commented on this decisive event of his life as follows: "As the end of my two years' term of office was approaching I submitted a request for another two years' extension, as had been granted to my predecessor Dr. Breit; I felt all the more bound to apply for this extension because I hoped during another two years of office to strengthen the evidence in favour of my opinions on puerperal fever in the light of other controversial views. However, my request was not granted, even at the time when my colleague serving in the 2nd clinic obtained an extension. My successor also obtained in due course a prolongation of his term of office for two more years" [23]. There is not a word of reproach in his writings, he has nothing to say against his chief, nor does he deplore his behaviour towards him.

Not so the contemporaries, who seriously rebuked Klein for his attitude towards Semmelweis and in the medical literature of the time he is made responsible for breaking up the professional career of Semmelweis.

Among the contemporaries, Kussmaul in his book quoted above severely condemns Klein. He had met him at frequent occasions, and found him to be a typical product of Austrian life in the period after Joseph II. He was a very mediocre practitioner, raised to his position through influential friends, and not professional merit. Sonderegger has the following to say: "We, the foreign students at the course complied with the measures faithfully, but the old clinician was extremely scornful. He was a poor sort of a professor! His lectures on puerperal fever were delivered like a dramatic piece: The organs were engaged in a dialogue. Peritoneum personified as the avenging angel of the obstinately resisting Uterus, Fever intervening, Ague protesting, and that sort of nonsense without end. When we had no money to go to the theatre we went to attend the Old Man's lecture, who was both rich and influential. We all were seriously devoted to Semmelweis, giving him the pet-name of Semmel Náci, and we were very sorry about the nasty treatment he received from his chief, although there were also other great men and famous doctors who made fun of him" [24].

Two great French obstetricians, A. Pinard and H. Varnier, also blamed Klein for refusing to extend Semmelweis's appointment as lecturer thus retarding the century's great discovery. Pinard wrote as follows: "His chief, Professor Klein, was insignificant in his profession, and owed his position more to his personality than to scholarly merit. He was always ready to underrate the value of others, jealous and hurt in his vanity, and ill-disposed towards his assistant" [25]. Varnier says: "It is to the discredit of Professor Klein that he cut short the impetus of Semmelweis, throwing back by at least twenty years the advance of one of the greatest achievements of the century" [26].

The *Journal of Obstetrics and Gynaecology of the British Empire* speaks of Klein as the "infamous prosecutor of his great assistant, Semmelweis" [27], others again call him "the Herostrates of obstetrics" [28].

Encyclopaedia Britannica does not spare Klein either but adds that the political situation was in his favour at the time he wanted to get rid of Semmelweis: "Klein apparently blinded by jealousy and vanity, supported by other reactionary teachers and aided by the disasters which then befell the Hungarian nation, drove Semmelweis from Vienna in 1849" [29].

Whatever the circumstances, Klein had achieved his aim: Semmelweis was compelled to leave the clinic.

Skoda Lecturing on Semmelweis's Discovery at the Academy of Sciences of Vienna

Semmelweis's disappointment must have been slightly mitigated by the fact that the Medical Society, where Rokitansky, Skoda and Hebra exercised influence, elected him after his dismissal from the clinic as a member on July 6th, 1849.

Skoda had not forgotten his case for a moment and had whole-heartedly thrown his lot in with Semmelweis's discovery. On October 18th, 1849 he delivered an address in the science section of the Vienna Academy of Sciences, in order to discuss the Semmelweis discovery and its implications [30]. Skoda stated that neither himself, nor Prof. Rokitansky had ever doubted that Semmelweis would be able to prove his theory. He confirmed that it was at his insistence that Semmelweis had made experiments on animals to prove his point. In his lecture Skoda referred to the high mortality in puerperal fever in the Obstetric Clinic of Prague, and called on its director to introduce the chlorine handwash.

It was at Skoda's instigation that the Academy of Sciences paid the sum of 100 forints to the hands of E. W. Brücke, Professor of Physiology, for animal experiments to be conducted by Semmelweis to support his clinical observations on puerperal fever [31].

Skoda's lecture, which was published by the Academy in a special brochure and also appeared in the periodical of the Medical Society, made great stir in the medical world, releasing a fresh wave of jealousy against Semmelweis. Scanzoni, the distinguished obstetrician of his time, then docent in Prague, on the eve of his appointment as professor at Würzburg University, felt that Skoda had meant to offend him in his person when referring in an adverse light to the lying-in hospital of Prague. He consequently could never forgive Semmelweis for this injury.

In spite of Skoda's good intentions and enthusiastic support, the lecture itself did more harm than good to the Semmelweis discovery, not only by creating new enemies. Unfortunately it was by some kind of misunderstanding that Skoda in his address spoke only of infection caused by cadaverous particles—an omission giving rise to controversy. Skoda presented the scientific world with a distorted Semmelweis theory, and the discoverer was never able to clear up this misunderstanding in his lifetime.

Nevertheless the lecture counted as a universal success. Justus Liebig, in one of his popular chemical letters, says about the Skoda lecture, and particularly about Semmelweis in 1851: "The lecture makes it obvious that the great practical discovery has met with scant recognition outside the sphere of the Academy. Naturally other causes of the puerperal fever could be later named, but the cause discovered by Semmelweis in the Obstetric Clinic of Vienna is undoubtedly one of these and must be recognized by every unbiased person" [32].

By that time it was possible to discuss the Semmelweis theory, or even to reject it, but it was no longer possible to ignore it.

Semmelweis Addresses the Medical Society of Vienna

It was a well-known fact in the official circles of Vienna that before the expiration of his appointment as lecturer, on February 9th, he had handed in an application for the title of *Privat-docent* in midwifery. In spite of the support of the majority

of the medicai faculty, his petition was not granted owing to the influence of Klein and Rosas. He was notified of this on April 2nd, 1850.

After Skoda's lecture the literary reaction to his theory was not favourable. Scanzoni, believing his professional reputation threatened by Skoda's lecture answered in a prejudiced article, in March 1850, trying to defend his scientific authority and to minimize the importance of the Semmelweis discovery [33]. He did not deny that in certain cases an external infection might produce puerperal fever, but he rejected outright the theory that it should be identical with pyaemia. He insisted that puerperal fever was an epidemic disease, originating under cosmic, telluric influences and maintained that the Semmelweis theory contained nothing new. As to the chlorine handwash, two and a half months of its application had produced adverse results in the Obstetric Clinic of Prague. During the March–April 1848 epidemic, his doctors had been little, or not at all engaged in post mortem dissections, they had rigorously applied the chlorine disinfectant, and, nevertheless, the epidemic had come to an end in May, 1848, after the handwash had been discontinued. It was evidently due to changing atmospheric conditions, with new cosmic, telluric influences more detrimental to the *genius epidemicus*. Scanzoni expressed his firm belief that experiments on animals would prove nothing as far as the aetiology of puerperal fever was concerned.

The journal that published Scanzoni's article inserted another contribution in the same number, from Bernhardt Seyfert, entitled: "Additional Remarks to the Preceding Article" in which the author gives evidence of his adverse experiences with the introduction of the chlorine handwash [34].

Somewhat later Scanzoni again contributed to the question of the Semmelweis theory. In the 27th volume for the year 1850 of the *Prager Vierteljahrschrift für praktische Heilkunde* he reviewed several articles appearing in foreign periodicals, all hostile to Semmelweis's theory concerning the aetiology of puerperal fever. In the same article he also refers to an article entitled "Cholera Epidemica", by Joseph Hamernik (1810–1887), Professor of Medicine in Prague, where the author tries to refute the theory with the argument that puerperal epidemics existed when there were no dissections, and they still exist where no dissections are carried out at all. This article, and other references, too, reflect the bad effect of Skoda's omission, due to the unfortunate mistake made by him in his lecture, where he attributed Semmelweis's discovery only to infection caused by cadaveric poison.

These were the antecedents to Semmelweis's decision to accept the invitation made by the Medical Society of Vienna, the year before. He gave his long-expected lecture entitled "The Origin of Puerperal Fever", on May 15th, 1850 with Prof. Rokitansky presiding [35].

In this lecture, Semmelweis tried to explain his theory, and prove his contentions by means of clear examples. In the records that still exist of the lecture we find that he had stated here for the first time that the infection might be conveyed by the doctor's hands, by infected instruments and just as readily by polluted air.

This momentous lecture was followed by discussions in consecutive meetings, on June 18th and July 15th. Theodor Helm, director of the General Hospital, Hector Arneth, assistant in the 2nd Obstetric Clinic, and Johann Chiari had contributed to the debate on the side of Semmelweis. Against him spoke Eduard Lumpe, a former colleague, who insisted that the theory must seem like Columbus's egg to all those who had spent a lifetime in studying the puerperal disease, prevention and epidemic outbreaks. According to him the great seasonal differences clearly proved that no single cause could be attributed to the puerperal infection. He was not opposed to the chlorine handwash, but he did not recognize cadaveric poison as the sole and only cause of puerperal fever. Lumpe did not seem to remember that Semmelweis had clearly stated in his address that cadaveric poison was by no means the only agent to cause puerperal fever [36].

The meeting was closed by the words of the presiding Rokitansky who, according to the minutes of the Medical Society, spoke of the overwhelming victory of Semmelweis in his summary.

Heinrich Herzfelder, secretary of the Medical Society, also referred to these addresses in the yearly report of 1850. After describing the Semmelweis theory, he concluded that through the effective measures of prevention, further outbreaks of the "epidemic" disease would be stopped. He was convinced that Semmelweis had succeeded in solving one of the greatest problems on the agenda of general medicine, and added further that, as to the question of the causation of the disease, Semmelweis was opposed by respectable adversaries in the persons of Dr. Zipfl and Dr. Lumpe, who on the evidence of statistical data had confirmed the miasmic origin of the disease. Semmelweis, however, had defeated this thesis, as well as those advanced by Dr. Scanzoni and Dr. Seyfert of Prague. In this manner, "the theory of the disease thus propounded and warmly supported by Dr. Arneth, Dr. Chiari and by the provisional director, Dr. Helm, from the point of view of veterinary science by Professor Hayne, can be considered as an overwhelming victory in the field of medical research" [37].

Schürer von Waldheim describes the meeting in the following words: "When Semmelweis had finished, in quick succession, Chiari, Helm, Arneth and Rokitansky addressed the meeting, each expressing his admiration for the ingenuity of his doctrine. It was a real triumph! The great supporters of the lecturer, Skoda, Hebra and Haller had kept silence. Perhaps it was in proof of their recognition and to promote the victory of the great discovery" [38].

Unfortunately Semmelweis made a fatal mistake. He did not consider it necessary for his address and the ensuing debate to be published in full. Only the minutes of the meetings of the Medical Society, and the above-mentioned report of the secretary of the Society have come down to us.

Close of Vienna Period

Coinciding with the period when he made his address, Semmelweis again and again applied for recognition as *Privat-dozent* of midwifery. The medical faculty

at its meeting on May 18th, 1850 accepted the request and the petition was passed on to the Ministry of Education. But as the Ministry had decreed that a "*Privat-docent*" should in his teaching be restricted to the use of a phantom in practical demonstrations, the faculty had made a special point that in the case of Semmelweis this clause should not be applied [39]. When at long last the appointment came through on October 10th, 1850, he was not exempted, and in the future he could only demonstrate on a phantom, not being permitted the use of a patient or a cadaver.

Among the list of classes for the winter term of 1850–51 we find the notice: "Lectures on Midwifery with practical demonstrations on the phantom, five times a week by Ignác Semmelweis." But they were never delivered [40].

Five days after receiving his diploma as *Privat-docent*, Semmelweis unexpectedly left Vienna, the scene of so much disappointment and humiliation. He did not believe that in Vienna he could go on with his experiments, nor did he expect any recognition for his discovery in that atmosphere.

Whatever may have been the causes or the motives for this decision, all that he says himself on the subject in his work is: "After having applied for a second time, with a delay of eight months, my appointment as *Privat-docent* for theoretical midwifery arrived on October 10th, 1850, with the restriction that my practical demonstrations could only be done on phantom. In this manner my docentship was of no use to me, the less so as according to the regulations a *Privat-docent* was required to lecture on exactly the same amount of subjects as the professor, who is by no means forbidden to demonstrate on a cadaver. In October of the same year I decided to remove myself to my birthplace, the city of Pest" [41].

The restriction clause in the appointment to the docentship was not serious enough in itself to account for his sudden decision to leave. His friend, Hektor Arneth had also received his appointment to a docentship in midwifery on November 4th, 1850, with the same restriction. His motives, therefore, must be sought in the circumstance that he must have been prevented from earning a livelihood, and hampered in carrying on his work satisfactorily for the good of humanity. He was disappointed and disheartened by the hostility of his chief, his dismissal from the clinic, unfair attacks directed against him, delay in granting the docentship, and finally his appointment containing a clause which he regarded as incompatible with the pursuit of his duties.

Semmelweis's biographers do not seem to agree on the causes which might have been responsible for this sudden departure. Before discussing these controversial views it may seem interesting to quote a letter in full written in this critical period of his life. It was addressed to his friend Lajos Markusovszky, and it is dated June 24th, 1850. It gives a glimpse into his private life, his sympathy with the revolutionary cause in Hungary and proves his close ties with his colleagues in Pest [42].

June 24th, 1850
Vienna

My dear Marko,

Seeing my letter you will probably puzzle your brain as to what happened to your laziest correspondent that at last he takes the trouble to produce one.

But don't worry, dear tarrier eper, the case is not so complicated, I am not quite so bad as you seem to think.

I must confess that I am not only filled by the desire to commit myself to paper, there is a trifling affair I would like to discuss with you.

Oh, Caroline it will be your fault if my friend Marko is stuck by astonishment. You will probably remember that I brought with me from Pest among other things a small locket, made from two Hungarian r-v-l-t-nary six-krajcár coins linked together.

As a matter of fact it turned out:

First, the locket made out of the coins is too small for the purpose.

Second, one locket is not enough, there should be at least two of the same.

Third, let me ask you my dear Marko, to have two lockets made, this time of larger twenty-krajcár coins. Sorry to hurry you, but they should be here, without fail, in ten days at the latest. You will be refunded by cable, to be not too quick, with my thanks. *But Marko, this is top secret!*

Kind regards to you and to Sandor

Yours, ever

Please, give my compliments to Prof. Balassa Natzl

According to Fischer, his unexpected departure cannot be explained by unfriendliness in Vienna, since he believes that apart from Prof. Klein he had no enemies, and he had been given in Vienna whatever help he needed. He had on his side Rokitansky, Skoda and Hebra, which proved their greatness and unbiassed scientific objectivity. ". . . It is entirely wrong to say that Semmelweis would have received no support in his wonderful achievement; nobody apart from Prof. Klein stood in his way" [43]. Fischer seems to be right when maintaining that Semmelweis had taken the adverse condition in his path more seriously than the friendship and support of the great men, but he is certainly not right in supposing that Semmelweis had no enemies apart from Klein. We have seen in the foregoing that he had plenty of ill-wishers. The years following his departure provide ample proof to show that the number of his enemies seemed rather to have increased than decreased.

Karl Braun was the ring-leader in the campaign against Semmelweis, first Klein's assistant and then successor in his chair. He was primarily led by a feeling of loyalty to his chief, but no less by a desire to improve his own relations with the leading obstetric circles. He had always been opposed to Semmelweis. G. Slaughter, on the other hand, thinks that Karl Braun had been hostile since his lecture in 1850, but it was not before 1855 that he openly attacked Semmelweis [44]. It is a fact that during his long professorship lasting 35 years, his students had never heard him pronounce the name of Semmelweis. In the second edition of his book which came out in 1881 the name of Semmelweis is once perfunctorily mentioned, when in the same year Prof. Paul Zweifel of Leipzig asserted in his handbook of obstetrics that modern midwifery began with Semmelweis [45].

In his book published in 1909 Fischer said that Semmelweis's only enemy in Vienna was Klein. Nevertheless in 1923 he could not refrain from seriously attacking Braun on account of his attitude towards Semmelweis [46].

Markusovszky thought that Semmelweis could not stand the impact of Vienna's stifling atmosphere on the scientific revolution, and personal grievances had given the excuse for quitting and going back to his native city. When reviewing the work of Semmelweis he says: "Semmelweis and the Vienna school? With the exception of a few scientists and physicians, as for instance Skoda and Chiari in that category, Semmelweis received no support either from the University or the Government of Vienna. Notwithstanding time-honoured custom, his assistantship had not been renewed, his docentship was first refused, and later granted with the restriction which did not allow him to perform obstetric demonstrations on a cadaver, only on a dummy. The suggestion of Prof. Skoda that Semmelweis should go on with his observations in the interest of science had been likewise rejected. In these circumstances, when the circles of reaction not only threatened to suppress political freedom but also desired to control science, when the word of Skoda and Rokitansky no longer had any weight before the Minister of Culture, and defying it had counted as a virtue: the revolutionary impetus of science had no fit place to stay on, Semmelweis had departed from a city which falsely called itself the seat of culture, and in the hope of a better future, had settled down in his native country in order to pursue his scientific studies" [47].

While Markusovszky is in full agreement with Semmelweis's decision, Schürer von Waldheim considers it the first symptom of mental instability: "It is very likely that this unfortunate, seemingly unmotivated decision was the first sign of the chronic mental disease of which the unfortunate Semmelweis had early fallen a victim" [48]. This opinion must be rejected outright. After leaving Vienna, Semmelweis lived for another fifteen years. During those fifteen years he practised as head of department and university professor, he was active in all spheres of scientific and social life, and was happily married. All this proves that until immediately before his death he had been in full possession of his mental faculties.

There is no doubt, on the other hand, that by his sudden departure Semmelweis had done immense harm both to himself and to the cause he so passionately propagated. He had not merely deprived himself of the possibility of proceeding with his researches, but he had also lost his most powerful supporters.

After that both Rokitansky and Skoda would have nothing to do with him. When for example the educational authorities of Zürich requested Rokitansky in 1856 to recommend a qualified obstetrician to the vacant chair of midwifery of Zürich University, Rokitansky merely replied that there was nobody suitable [49].

Professor Skoda in his further researches on puerperal fever indisputably identified himself with the infection theory, but never again pronounced the name of Semmelweis. Schürer von Waldheim gives the following explanation of Skoda's

behaviour: "Among them all, Skoda was the most deeply hurt on account of Semmelweis's ingratitude and strange behaviour. He said that he had given his help to an unknown and helpless young man, though a well-known clinician himself, he had supported this inexperienced, young assistant in developing his thoughts, and he had ended up by making himself enemies. He did not mind it because he was ready to fight for a good cause. But when victory seemed no longer beyond reach, it was Semmelweis who had left him in the lurch! Skoda had withdrawn, and no longer opened his mouth. For him Semmelweis did not exist any more" [50].

Slaughter believes that Chiari, who succeeded Kiwisch in Prague, had also withdrawn from Semmelweis, because between 1851 and 1854 he did not raise his voice on his side. In his lecture on puerperal fever given to the Medical Society of Vienna on June 27th, 1851 the name of Semmelweis was not even pronounced.

Semmelweis's best friends, and also his widow seem to corroborate this view. Hebra alone kept up friendly relations with Semmelweis until his death.

The studies of Erna Lesky, the excellent medical historian of Vienna, have added considerably to what we know about the second medical school, the influence of Rokitansky and Skoda, the differences between the conservative and progressive medical circles, and their impact on the career of Semmelweis. It was Lesky, who, on the basis of original records, investigated the question of the docentship application, which may have influenced Semmelweis in his departure [51].

The most important period of Semmelweis's life had come to an end with his departure from Vienna.

Notes

1. The expression "puerperal sun" was used by Semmelweis in his open letter addressed to Joseph Späth. Cf. Chapter V.
2. "*Für die Bestrebungen seines Assistenten fühlte Klein keine Teilnehmen. Die Koryphäen der jungen Wiener Schule, namentlich Skoda und Hebra, erkannten die Tragweite der Entdeckung von Semmelweis und unterstützten ihn möglichst. Klein aber stellte sich seinen Untersuchungen hindernd in den Weg, schwerlich aus Bosheit, sondern aus Unverstand*". Cf. A. Kussmaul, *Jugenderinnerungen eines alten Arztes*. (Stuttgart, 1899).
3. "*Die Redaction dieser Zeitschrift fühlt sich verpflichtet, die folgenden von Herrn Doktor Ig. Semmelweis, Assistenten an der ersten geburtshilflichen Klinik des hiesigen k. k. allgemeinen Krankenhauses gemachten Beobachtungen in Hinsicht der Aetiologie, der, beinahe in allen Gebäranstalten herrschenden Puerperalfieber hiermit dem aerztlichen Publicum mitzuteilen.*

   "*Herr Dr. Semmelweis, der sich bereits über fünf Jahre im hiesigen k. k. Krankenhause befindet, sowohl am Secirtische als auch am Krankenbett in den unverschiedenen Zweigen der Heilkunde sich gründlich unterrichtete, und endlich während der letzten zwei Jahren seine spezielle Tätigkeit dem Fache der Geburtshilfe zuwendete, machte es sich zur Aufgabe, nach der Ursache zu forschen, welche dem so verheerenden, epidemisch verlaufenden Puerperalprocesse zu Grunde liege. Auf diesem Gebiete wurde nun nichts ungeprüft gelassen, und Alles, was nur irgend einen schädlichen Einfluss hätte ausüben können, wurde sorgfältig entfernt.*

"Durch den täglichen Besuch der hiesigen pathologisch-anatomischen Anstalt hatte nun Dr. Semmelweis den schädlichen Einfluss kennen gelernt, welcher durch jauchige und faulige Flüssigkeiten auf selbst unverletzte Körpertheile der mit Leichensectionen sich beschäftigenden Individuen ausgeübt wird. Diese Beobachtung erweckte in ihm den Gedanken, dass vielleicht in Gebäranstalten von den Geburtshelfern selbst Schwangeren und Kreissenden der furchtbare Puerperalprocess eingeimpft werde, und dass er in den meisten Fällen nichts anderes, als eine Leicheninfection sei.

"Um diese Ansicht zu erproben, wurde auf dem Kreisszimmer der ersten geburtshilflichen Klinik die Anordnung getroffen, dass Jeder, der eine Schwangere untersuchen wollte, zuvor seine Hände in einer wässerigen Chlorkalk-Lösung (Chlor. calcis unc. 1, Aquae fontanae libras duas) waschen musste. Der Erfolg war ein überraschend günstiger; denn während in den Monaten April und Mai, wo diese Massregel noch nicht gehandhabt wurde, auf 100 Geburten noch über 18 Todte kamen, verhielt sich in den folgenden Monaten bis inclusive 26. November die Anzahl der Todten zu den Geburten wie 47 zu 1547, d. h. es starben von 100 – 2,45.

"Durch diese Thatsache wäre vielleicht auch das Problem gelöst, warum in Hebammen-Schulen ein so günstiges Mortalitäts-Verhältniss im Vergleiche zu den Bildungsanstalten für Geburtshelfer herrscht, mit Ausnahme der Maternité in Paris, wo — wie bekannt — die Sectionen von Hebammen vorgenommen werden.

"Drei besondere Erfahrungen durften vielleicht diese so eben ausgesprochene Ueberzeugung noch weiter bestätigen, ja sogar den Umfang derselben noch erweitern. Dr. Semmelweis glaubt nämlich nachweisen zu können, dass:

1. *durch vernachlässigten Waschen einiger mit Anatomie sich beschäftigender Schüler im Monate September mehrere Opfer gefallen sind; dass*
2. *im Monate October durch häufige Untersuchung einer, an verjauchendem Medullarsarcom des Uterus leidenden Kreissenden, — wonach die Waschungen nicht beobachtet wurden; sowie endlich*
3. *durch ein, im Unterschenkel einer Wöchnerin vorhandenes, ein jauchiges Secret lieferndes Geschwür — mehrere von dem mit dieser gleichzeitig Entbundenen inficirt wurden. Also auch die Uebertragung jauchiger Exsudate aus lebenden Organismen kann die veranlassende Ursache zum Puerperalprocesse abgeben.*

"Indem wir diese Erfahrungen der Oeffentlichkeit übergeben, stehen wir an die Vorstehen sämmtlicher Gebäranstalten, von denen schon einige durch Herrn Dr. Semmelweis selbst mit diesen höchst wichtigen Beobachtungen bekannt gemacht wurden, das Ansuchen das Ihrige zur Bestätigung oder Widerlegen derselben beizutragen." Cf. Höchst wichtige Erfahrungen über die Aetologie der in Gebäranstalten epidemischen Puerperalfieber. Editorial in *Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien* (1847) p. 242.

4. Crasis, i.e. defective composition of blood, was supposed to be the origin of various illnesses. Rokitansky even distinguished between these various compositions of the blood, each of which may, according to him, be explained by chemical changes. Cf. Rokitansky, *Handbuch der pathologischen Anatomie.* (Wien, 1842–46) vol. III, p. 555.
5. Rokitansky, op. cit. 2nd ed. vol. III, p. 560.
6. *Im Dezemberhefte 1847 dieses Journals wurde von Seite der Redaction desselben die höchst wichtige Erfahrung veröffentlicht, die Herr Dr. Semmelweis, Assistent an der ersten geburtshilflichen Klinik, in Hinsicht auf die Aetiologie des in Gebärhäusern epidemischen Puerperalfiebers gemacht hat.*

   Diese Erfahrung besteht nämlich (wie es den Lesern unserer Zeitschrift noch erinnerlich sein wird) darin, dass Wöchnerinnen hauptsächlich dann erkrankten, wenn sie von Aerzten, die ihre Hände durch Untersuchungen an Leichen verunreinigt und nur auf gewöhnliche Weise gewaschen hatten, untersucht (fouchirt) wurden; während entweder keine oder nur sehr geringe Erkrankungsfälle Statt fanden, wenn der Untersuchende seine Hände früher in einer wässerigen Chlorkalk-Lösung gewaschen hatte.

   Diese so höchst wichtige, der Jenner'schen Kuhpockenimpfung an die Seite zu stellende Ent-

deckung hat nicht nur seither im hiesigen Gebärhause ihre vollständige Bestätigung erhalten, sondern es haben sich auch aus dem fernen Auslande beifällige Stimmen erhoben, welche die Richtigkeit der Semmelweis'schen Theorie beglaubigen. Eingelangte Briefe, und zwar aus Kiel von Michaelis, und aus Amsterdam von Tilanus sind es, welchen ich diese bestätigenden Mittheilungen entnehme.
"Um jedoch dieser Entdeckung ihre volle Gültigkeit zu gewinnen, werden hiermit alle Vorsteher geburtshilflicher Anstalten freundlichst ersucht, Versuche anzustellen, und die bestätigenden oder widerlegenden Resultate an die Redaction dieser Zeitschrift einzusenden." Cf. Fortsetzung der Erfahrung über die Aetiologie der in Gebäranstalten epidemischen Puerperalfieber. *Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien* (1848).

7. *"Von allen Bekanntschaften, die ich in Wien gemacht habe, ist mir die von Semmelweis in angenehmster und dankbarster Erinnerung geblieben. Als wir ihn kennen lernten, hatte er die grosse, segenreiche Entdeckung, die ihm die Menschheit verdankt, kurz zuvor gemacht; sie beschäftigte ihm fortwährend und war der Gegenstand unserer täglichen Gespräche mit dem trefflichen Manne."*
8. The popular work of J. L. Sonderegger, *Vorposten der Gesundheitspflege*, had 4 editions until 1892. Cf. *Aerzte-Memoiren aus vier Jahrhunderten.* Ed. by E. Ebstein (Berlin, 1923) pp. 315–328.
9. Semmelweis, op. cit. p. 296.
10. Simpson had attacked the surgical measures of Lister to the same extent as those of Semmelweis. At a later period Simpson had given up his view that puerperal fever was a contagious disease, considering it identical with surgical fever. Cf. *Monthly Journal of Medical Sciences* (*Edinburgh*) (1950) pp. 414–429. Among the Semmelweis biographers Sinclair and Hegar believe that after the lecture of Arneth in Edinburgh, April 16th, 1851, Simpson accepted the Semmelweis theory. Cf. Sinclair, *Semmelweis, his Life and Doctrine* (Manchester, 1909) p. 74; *Lancet* (1909) pp. 815–16; V. Robinson, Pathfinders in Medicine: Semmelweis. *Med. Review of Reviews*, New York (1912) pp. 232–246. The same is corroborated by Simpson's nephew and successor, Alexander Russel Simpson, in a letter addressed to the Semmelweis Memorial Committee. Cf. *A Nemzetközi Semmelweis Emlék* (*International Semmelweis Memorial Volume*). (Budapest, 1906) p. 90. Semmelweis had also known about Simpson's revised opinion, since in 1860 he wrote: "Simpson himself had given up the view that puerperal fever was a contagious disease and identified it with surgical fever, he said: 'Neither in puerperal nor in surgical fever is the inflammation caused by fever, but both the fever and the inflammation are due to the same cause: a spontaneous blood dissolution. But as to what it is that causes this dissolution in the blood will be answered by later ages when pathological-histological chemical research will be more developed.' This question, however, had been solved, because blood dissolution in puerperal and surgical fever and both the subsequent fever and inflammation are caused by putrid, organic, animal material". Cf. Semmelweis, op. cit. p. 60.
11. *Hospitals Meddelser* (1848).
12. M. F. Wieger, Des moyens prophylactiques mis en usage au grand hôspital de Vienne contre l'apparition de la fièvre puerpérale. *Gazette Médicale de Strasbourg* (1849) pp. 97–105. Wieger's article was translated by P. Pertik in 1888. Cf. A bécsi közkórházakban a puerperális láz fellépése ellen alkalmazott prophylactikus eszközökről (Prophylactic Measures Applied against Fever in Public Hospitals in Vienna. *Orvosi Hetilap* (*Medical Weekly*) (1888) pp. 210–215. At Wieger's suggestion Semmelweis had sent a letter concerning his observations on the aetiology of puerperal fever to the Medical Academy of Paris, but he received no reply.
13. About the middle of January 1849 Routh told Semmelweis about his lecture held in London with the title "On the Causes of the Endemic Puerperal Fever of Vienna". Cf. *Medico-Chirurgical Transactions* 32 (1849) pp. 27–40; *Lancet* (1848) pp. 642–43; *American Journal of Medical Sciences* (1849) pp. 509–510; *Edinburgh Medical and Surgical*

Journal (1851) pp. 244–251. The lecture was included in the German edition of Collected Works of Semmelweis, and is referred to in *Zeitschrift für Natur- und Heilkunde in Ungarn* (1850) p. 16.

14. I. Fischer: *Geschichte der Geburtshilfe in Wien.* (Leipzig–Wien, 1909) p. 523.
15. I. Barta: A magyar szabadságharc vezetői és a bécsi októberi forradalom (Leaders of the Hungarian War of Independence, and the October Revolution in Vienna). *Századok* (*Centuries*) (1951) pp. 443–485.
16. "*Semmelweis gehörte zu den begeisterten, glühendsten Freiheitskämpfern.*" Cf. Schürer von Waldheim, *Semmelweis, Sein Leben und Wirken. Urteil der Nachwelt.* (Wien, 1905) p. 90.
17. Hódolat Semmelweisnek (Homage to Semmelweis). *Az Újság* (*The News*), Oct. 2nd, 1906.
18. F. Boenheim, *Virchow. Werk und Wirkung.* (Berlin, 1957) p. 329; I. Fischer, *Wiener Mediziner und die Freiheitsbewegung des Jahres 1848* (Wien, 1935) p. 94.
19. Sinclair, op. cit. pp. 60–70.
20. "*In dem Grabe Rosas ruht eine Zelebrität der Vergangenheit, eine der letzten Stützen jenes alt und morsch gewordenen Tempels, welcher den stürmenden Fortschritten der Neuzeit nicht die Kraft des Widerstandes entgegensetzen konnte.*" Cf. Nekrolog. *Wiener Medizinische Wochenschrift* (1855) pp. 363–364.
21. "*Die Bedeutung dieser Erfahrung für die Spitäler überhaupt, insbesondere für die chirurgischen Krankensäle ist eine so unermessliche, dass sie der ernstesten Beachtung aller Männer der Wissenschaften würdig erscheint . . .*" Cf. K. Haller, Über die von Dr. Semmelweis entdeckte wahre Ursache in der Wiener Gebäranstalt ungewöhnlich häufig vorkommenden Erkrankungen der Wöchnerinnen und des Mittels zur Verminderung dieser Erkrankungen bis auf die gewöhnliche Zahl. *Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der kaiserl. Akademie der Wissenschaften* (1849) p. 168.
22. Fischer, op. cit. p. 288 (Note 14).
23. Semmelweis, op. cit. p. 136.
24. "*Wir fremden Kursteilnehmer befolgten die Vorschriften gläubig und streng, der alte Kliniker aber verhöhnte sich bei jedem Anlasse. Es war ein Jammer-Professor! Seine Schilderung vom Kindbettfieber tönte wie ein Drama: Dialoge zwischen den einzelnen Organen, Rache des Bauchfells gegen den zornig sich aufbäumenden Uterus, Exekution durch das Fieber, Pfandrecht bei den Schüttelfrösten und dergleichen Unsinn ohne Ende. Wenn wir nicht ins Theater gehen konnten, hörten wir einen solchen Vortrag des an Geld und Einfluss reichen Alten. Mit ganzem Herzen aber hingen wir am 'Semmel-Nazi', der nicht nur von seinem Vorgesetzten schnöde behandelt, sondern auch von bedeutenden Männern und hervorragenden Aerzten bespöttelt wurde.*"
25. "*Son chef, le professeur Klein, spécialiste de peu d'importance, ayant du sa situation plutôt aux agréments de sa personne qu'a ses titres scientifiques, blessé dans sa vanité, jaloux, disposé à diminuer toujours les mérites des autres va poursuivre désormais de sa haine son assistant.*" Cf. A. Pinard, Ignace-Philippe Semmelweis. *Extrait des Annales de Gynécologie et d'Obstetrique*, Novembre, 1906.
26. "*Ce sera l'éternelle honte du professeur Klein d'avoir arrêté l'essort de Semmelweis et reculé ainsi de vingt ans au moins l'un des plus grand progrès de ce siècle.*" Cf. H. Varnier, *Pratique des accouchements obstétrique journalière* (Paris, 1900) p. 437.
27. *Journal of Obstetrics and Gynaecology of the British Empire* (1909) (In the review of Fisher's history of obstetrics).
28. "*Johann Klein war seit 1822 Leiter der geburtshilflichen Klinik. Sein Name hat durch sein Verhältniss zu Semmelweis eine Art von herostratischer Berühmtheit erlangt. Seine Stellung verdankte er wohl mehr angenehmen persönlichen Eigenschaften als den Hoffnungen, die seine wissenschaftliche Tätigkeit erwecken konnten.*" Cf. M. Neuberger, *Die Wiener Medizinische Schule im Vormärz.* (Wien–Berlin, 1921) p. 61.
29. *Encyclopaedia Britannica.* 14th ed. vol. 20 (1957).
30. Cf. Note 21.
31. On Oct. 31st, 1850, Brücke communicated to the Academy that, in full agreement with

Semmelweis, the animal experiments had been stopped as unsuitable to decide the clinical problems in question. In the same report Brücke makes mention of Semmelweis's sudden departure to Pest. Cf. *Sitzungsberichte der mat.-naturwiss. Classe* (1850) p. 291.

32. "*Aus diesem Vortrage (des Professors Skoda) ergibt sich nebenbei, wie gering die wichtige Entdeckung ausserhalb der Akademie gefunden hat. Gewiss werden sich noch mehrere Ursachen des Kindbettfiebers namhaft machen lassen; dass aber die von Dr. Semmelweis mit allem Scharfsinn eines vorurteilsfreien Forschers in der Gebäranstalt zu Wien ermittelte Ursache eine derselben ist, daran kann wohl kein Unbefangener zweifeln.*" J. Liebig, *Chemische Briefe*, 3rd ed. (Heidelberg, 1851) p. 312.
33. *Prager Vierteljahrschrift für praktische Heilkunde* (1850) p. 33.
34. B. Seyfert, Ergänzende Bemerkungen zu dem vorstehenden Aufsatze. Ibid.
35. "*Über die Genesis des Puerperalfiebers.*"
36. Lumpe's address appeared in: Zur Theorie des Puerperalfiebers, *Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien* (1850) pp. 392–398.
37. "*. . . die Krankheits-Idee, welche auch an den Doktoren Arneth, Chiari und den provis. Direktor Helm, sowie vom tierärztlichen Professor Hayne, wahrer Triumph medizinischer Forschung angesehen werden kann.*" Cf. *Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien* (1850) pp. 8–9; ibid. (1851) p. 1; Semmelweis, op. cit. pp. 378–379.
38. "*Und dann erhoben sich der Reihe nach Chiari, Helm, v. Arneth und Rokitansky um Semmelweis unbestreitbaren Verdiensten ihre Anerkennung auszusprechen. Es war eine grosse feierliche Huldigung! Die Hauptförderer des Gefeierten, Skoda, Hebra, Haller sahen schweigend zu. Vielleicht hatten sie selbst im Stillen die Huldigung vorbereitet, um der so segensreichen Entdeckung zum Durchbruch zu verhelfen.*" Cf. Schürer von Waldheim, op. cit. p. 77.
39. Fischer, op. cit. p. 96.
40. "*Vorlesungen über Geburtshilfe mit praktischen Demonstrationen am Phantome. 5-mal die Woche.*"
41. Semmelweis, op. cit. pp. 136–137.

42. Wien den 24/6 850

Mein lieber Marko!

Was ist denn eigentlich geschehen wirst Du dich selbst fragen, nachdem Du meinen Brief von Angesicht zu Angesicht wirst gesehen haben; dass der bis zur Impertinenz nachlässiger Correspondent Natzl endlich einmal schreibt.
Erschrecke nicht lieber tarier eper wieder a pissel, nachdem Du der Sache wirst fest ins Auge geschauen haben wirst Du auch überzeugt seyn, dass sie eben nur schrecklich zu seyn scheint.
Abgesehen von dem Drange meines Herzens, welcher mich unwiderstehlich zwingt mich mit Dir brieflich zu unterhalten ist es noch eine andere Kleinigkeit welche ich bey dieser Gelegenheit abmachen will.
Ach Karlinchen Du trägst die schwere Schuld, wenn meinen Freund Marko der Schlag aus Uiberraschung niederstreckt. Du wirst Dich noch erinern das ich unter anderen auch ein Medaillon verfertiget aus zwey ungarische r-v-l-t-ns. Sechsern durch ein Charniere-Gelenk vereiniget aus Pesth mitgenomen. Plötzlich stellt es sich heraus das
I mein aus Sechsern verfertigtes Medaillon zu klein sey
II das eines zu wenig sey, das um allen Bedürfnissen abzuhelfen deren zwey vorhanden seyen müssen Ich stelle diese dri. Bitte an Dich mein Marko lasse mir Zwey aus Zwanzigern ungarischen bestehende Medaillons anfertigen, aber sehr schnell, selbe müssen bis längstens nach 10 Tagen in Wien seyn die ausgelegte Sume werde ich Dir um nicht schnell zu seyn mittels des Telegraphen mit Dank rückerstatten. **Marko sey verschwiegen!**
Ich grüsse Dich und Sandor vielmals und verbleibe Euer

Freund Natzl

Prof. Balassa
meine Empfehlung

Natzi, pet-name of Semmelweis, from Ignaz. In the original letter, a strange pet-name is given to Markusovszky: "tarier eper". It may come from French, or may have been some slang expression known among the medical students in Vienna, or in his circle of intimate friends. Caroline's identity cannot be traced. R-v-l-i-nary = revolutionary, to evade censorship. Krajcár, the smallest Hungarian coin. The incident is not only interesting because Semmelweis presented his friend with a locket made out of Hungarian revolutionary coins, but we are informed about his visit to Pest in 1849–50. This has not been known so far. Sándor is probably an old friend, Sándor Lumnitzer, a leading figure in the War of Independence, later Professor of Surgery in Budapest University. Professor J. Balassa, Professor of Surgery in Pest University, well-known revolutionary fighter. The original of our letter is in the possession of the Welcome Historical Medical Museum and Library. József Antall has made a copy of it. Cf. J. Antall, *Communicationes de Historia Artis Medicinae* No. 46. Budapest.

43. "*Somit ist es nicht richtig, dass Semmelweis in Wien kein Verständnis für seine eminente Leistung gefunden hat; es war eigentlich nur Professor Klein der seiner Lehre im Wege stand.*" Cf. J. Fischer, op. cit. p. 303.
44. G. F. Slaughter (b. 1908), American physician and novelist, *Immortal Magyar, Semmelweis, Conqueror of Childbed Fever*. (New York, 1960).
45. P. Zweifel, *Lehrbuch der Operativen Geburtshilfe für Aerzte und Studierende* (Stuttgart, 1881).
46. J. Fischer: Worte der Erinnerung an Karl von Braun. *Wiener Medizinische Wochenschrift* (1923) p. 11.
47. L. Markusovszky, Semmelweis tanár gyermekágyi lázról írt munkájának ismertetése (Reviewing Prof. Semmelweis's Book on Puerperal Fever). *Orvosi Hetilap* (*Medical Weekly*) (1861) pp. 12–14.
48. "*Möglich, ja wahrscheinlich, dass dieser unselige, anscheinend gänzlich unmotivierte Entschluss das erste Anzeichen des beginnenden chronischen Gehirnleidens war, dem der unglückliche Semmelweis frühzeitig zum Opfer fallen sollte.*" Cf. Schürer von Waldheim, op. cit. p. 90.
49. W. L. Brunn, Wurde I. Ph. Semmelweis im Jahr 1857 an die Universität Zürich berufen? *Vierteljahrschrift der Naturforschenden Gesellschaft in Zürich* (1951) pp. 73–76.
50. "*Auf tiefste verletzt über Semmelweis' Undank und Narretei war Skoda. Dem unbeholfenen jungen Manne war er freudig beigesprungen und hatte sich, er, der berühmte Kliniker, mit selbstloser Hingebung für die Ideen des unbekannten Assistenten eingesetzt; er hatte sich dadurch nun neue Feinde und neue Kämpfe heraufbeschworen. Doch das fochte ihn nicht an. Er nahm den Kampf auf um der guten Sache willen. Und schon winkte der Sieg, da liess ihn sein Schützling selber in Stich! Skoda zog seine Hand zurück und schwieg fortan. Für ihn existierte Semmelweis nicht mehr.*" Schürer von Waldheim, op. cit. pp. 90–91.
51. E. Lesky, *Österreichisches Gesundheitswesen im Zeitalter des aufgeklärten Absolutismus.* (Wien, 1959); idem, *Ignaz Philipp Semmelweis und die Wiener medizinische Schule.* (Wien, 1964); idem, *Die Wiener Medizinische Schule in 19. Jahrhundert.* (Graz–Köln, 1965).

Chapter Four

Semmelweis in Pest

Midwifery in Hungary prior to Semmelweis — The silent country — Semmelweis, head of department at Rochus Hospital — Semmelweis appointed to the Chair of Obstetrics in the University in Pest — Marriage — Invitation by Zürich University to Chair of Obstetrics — The "Instructions" — Professorship — The Presidential Council's decree to introduce Semmelweis's obstetric prophylaxis

Midwifery in Hungary Prior to Semmelweis

In eighteenth century Hungary there were hardly any obstetricians yet, there were only midwives practising their trade. Until the second half of the century, midwifery was still a free craft and midwives could practise without interference from a guild. No one was responsible for their training, if they had any at all, with the clergy exercising spiritual control of a sort over their activities.

The first royal statute for the control of midwifery was issued in 1770, as one chapter in the "general rules" for public health, the *Generale Normativum Sanitatis*. This basic document, with additional supplements issued in 1773 and 1787 was responsible for the administration of public health up to 1848. Its fourth section, in eight chapters, contains provisions relating to the midwife's profession [1].

It was not until 1774 that a university statute (*ordo studiorum*) provided for the training and teaching of midwife students, who, according to this, had to attend yearly three, subsequently two, courses to receive training in their duties relating to pregnant and lying-in women and new-born babies. The lectures were followed by practical demonstrations on "obstetric machines" (*machina obstetriciae*).

The early courses for midwives had not been open to more than 5–6 students. In 1781 the Presidential Council ordered that larger villages should send, at their own expense, to the midwife-training courses persons of good morals, capable of reading and writing. Later more students had been admitted to the courses, and in the period preceding the activity of Semmelweis their number had risen to about one hundred.

A midwife's diploma could be obtained from the faculty of medicine if the candidate passed her examination successfully before a committee, presided over by the dean. Thus, between 1770 and 1800, 438 diplomas had been issued by the faculty of medicine. After receiving her diploma the new midwife had to take an oath. The number of qualified midwives was far from sufficient to provide regular service for confinements throughout the country.

A new provision had slightly improved the situation, by virtue of which the title of obstetrical master (*magister obstetriciae*) could be obtained. The courses to qualify for the degree of obstetrical master had been started at the medical faculty of the University of Nagyszombat, founded in 1769, and in the Medico-Surgical Institute opened at Kolozsvár in 1775, where regular training was offered both to midwife students and obstetrical masters. A new provision had made it possible for the holders of medical and surgical degrees to obtain the title of obstetrical master after passing an adequate examination. The subjects in the qualifying examination were the following: theoretical midwifery, surgical midwifery (on the phantom), forensic obstetrics. It was made compulsory for surgeons holding official positions (county and borough surgeons) to apply for the degree of obstetrical master. The medical faculty of the university had issued 415 degrees to obstetrical masters between 1769 and 1800.

Special instruction for obstetrical masters had continued until 1875, from which date onwards medical students had been obliged to sit for examinations in midwifery at the University of Pest. Before this only midwives as well as surgical and medical students who wanted also to qualify as obstetrical masters had been obliged to pass examinations in practical obstetrics. The joint training of medical and midwife students had been the source of much inconvenience right up till 1881, when the training of midwives became the exclusive duty of the newly founded 2nd Obstetrical and Gynaecological Clinic.

The first Hungarian textbook on midwifery, *Instruction for the Midwife* (Debrecen, 1766) was written by István Weszprémi (1723–1799), the learned chief medical officer of Debrecen and the first Hungarian medical historian. It was not original but only a translation, written in a simple style to suit the midwife [2]. Yet the book is remarkable for being the first of its kind to publish "anatomical figures" for instruction, 17 plates in all. There is a plate showing a chair, frequently used at that time in labour everywhere in Hungary. This was followed by other textbooks on obstetrics, written in the Hungarian language, but only for midwives [3].

It was some time before the first Hungarian textbook of midwifery written for medical students and physicians appeared. *A Handbook of Midwifery* was published in 1904, edited by Dr. Sándor Doktor, being the work of his former chief, Tivadar Kézmárszky, second successor of Semmelweis, who had left it behind in manuscript form. The book which filled a gap was of a very high standard.

Joseph Plenck's textbook on midwifery, written in German and published in Vienna 1768, with five further editions by 1795, had been in great demand in the Hungarian universities [4].

The medical journals of the time had published only a few articles on midwifery and obstetrics. There had been hardly any obstetric articles in the first Hungarian medical paper, *Medical Review* (*Orvosi Tár*) between 1831 and 1848, when the paper ceased to exist, and these contributions described deformed infants and other such curiosities. Between 1848 and 1857 no medical periodical had appeared at all. The *Medical Weekly* (*Orvosi Hetilap*) came out in 1857 and

Medical Practice (*Gyógyászat*) in 1860, both publishing articles on midwifery and obstetrics, in limited numbers [5].

The first chair in obstetrics was established in the University of Pest in 1807. Between 1770 and 1807 the professors of other faculties had lectured on midwifery: until 1783, Plenk, Professor of Surgery, after him György Stáhly (1755–1802) had lectured on midwifery intermittently with surgery and ophthalmology, between 1788 and 1802 with anatomy. The subject had been taken over between 1803 and 1805 by János Szenning (1757–1806), Professor of Pathollogy, and after 1805 Elek Ágoston (d. 1809) Professor of Ophthalmology had lectured on midwifery. Ágoston was first Assistant Professor of Midwifery. After 1807 he had been recognized as the Professor of Midwifery.



Ede Flórián Birly

As the first Professor of Obstetrics only, Ede Flórián Birly (1787–1854) was appointed to the chair of "theoretical and practical midwifery" in 1816. Birly was considered a fairly good expert. He had studied in the University of Vienna and had been lecturer at Boer's institute from 1844 [6]. In Birly's time the obstetrical clinic had consisted of three rooms, with no more than 300 confinements yearly.

Birly who had been rector of the university in 1842 has left no contribution to the medical literature of the time. Nevertheless, the level of instruction in the field of midwifery improved considerably during his professorship. Jankovich had the following to say about Birly: " . . . no word in praise of his practical instruction could do Birly justice; his delaying tactics and then picking the right moment had made him the supreme master of midwifery" [7]. It seems evident from this comment that Birly had adopted Boer's views on delivery based on the principle of waiting with patience.

Birly had a theory of his own about puerperal fever. He believed that the disease developed because of the impure state of the bowels. In 1840 puerperal mortality was lower in his clinic than in Vienna, and he thought that it was due to the abundant use of purgatives. He stuck to his theory even after instruction of anatomical pathology had started in the Pest University in 1844, and the clinic had to be closed at various intervals owing to serious outbreaks of puerperal epidemic. Birly never gave up his theory, but continued to adhere to it even when

Semmelweis had begun to work in Pest and had succeeded in proving the truth of his own theory in practice.

Nevertheless midwifery continued to play a subordinate role in the University of Pest, since until 1869 it had not been a compulsory subject and, as we have said above, students did not have to pass examinations in midwifery before 1875.

Only Markusovszky had seen that all this was wrong. In 1865 he had appealed to the university students of Pest not to neglect the study of midwifery, a subject of immense importance in medical practice. " . . . What is more important in medical practice than midwifery? It is doubly so as the young practitioner must know that in provincial practice expert skill in midwifery is essential, and a lack of it may cause a deplorable loss of life. We are appealing to the medical students of our university, and beg them not only to study the subject from books, but try to acquire skill in its practical adoption. The time will come when midwifery, as in our university, will not only be complementary to surgery (what an anomaly!) but will be a subject for the doctor in its own right, and its instruction will be supplemented with practical demonstrations. But let us anticipate this long overdue reform of our studies and lend an ear to its study application . . ." [8].

The small number of beds in the Obstetric Clinic was more than insufficient and it was of little help that the Rochus Hospital had an obstetrical and gynaecological department of its own, since it was not allowed to admit childbed patients except in the summer months, so as not to prejudice the regular obstetrical teaching in the clinic. The idea of opening private lying-in homes had matured by the middle of the century, but, owing to the unfavourable opinion both of the Medical Society of Pest–Buda and the medical faculty of the university, no permits had been granted by the Presidential Council [9].

This was the situation in midfivery in Pest and in the whole of Hungary at the time when Semmelweis returned.

The Silent Country

Semmelweis arrived back in Pest at the end of October 1850, disappointed and disillusioned, and soon found that the situation was not very hopeful for him here either. He was not hampered by ill-feeling and resentment as far as his person was concerned, and there was no hostility towards his teachings, only the conditions in Hungary restrained his activity.

The War of Independence had ended in defeat, and after the surrender at Világos Hungary was in a sad predicament. The Austrian constitution only recognizing one imperial state, Hungary degenerated into a mere province, like Venice and Lombardy. The heel of the conqueror was heavy, political suppression had wiped out the last vestiges of the revolutionary spirit, and police supervision and strict censorship had brought life to a standstill, even in the domain of science and culture [10].

It was not in the interest of the foreign ruler to permit free cultural life to flourish in Hungary. The autocratic government of Vienna by its incessant harassment of the Hungarians had crushed the cultural upheaval so characteristic of the decades preceding the revolution, which had been called the Age of Reform. The cultural and scientific institutions had stopped to function by themselves or by force.

Scientific life had reached complete stagnation, and the medical institutions which had been established at the end of the thirties and forties of the century had closed down. Among these were the Medical Society of Pest–Buda, the Society of Natural Sciences, the Conference of Hungarian Physicians and Natural Scientists.

The Medical Society, the country's second oldest scientific organization after the Hungarian Academy of Sciences, played an important role in organizing and reviving Hungarian medical life. Actually this important social organization was founded by 44 medical practitioners in Pest and Buda on December 1st, 1837, with the aim of developing experimental and clinical trends, that is a medical science based on natural historical research.

The Medical Society, as well as two other medical associations had been obliged to close their doors. After a year's enforced closure, the chairman of the society, János Wagner (1811–1889) had obtained permission, towards the end of January 1850, to re-open and to begin work again, under official supervision. In the year 1850–51 the society had simply existed without doing very much work. With its meagre funds, it was unable to bring about a climate suitable for the promotion of scientific or literary activity.

The main trouble was the lack of money and suitable premises to hold lectures in. Nevertheless it was at that time that the Medical Society gained importance. In that period only social manifestations, if any, were possible, with the Medical Society as the one available organ and medium of public life for the physicians, both from a social and scientific point of view. And as such, the civil government often consulted it in matters of public, medical interest [11].

Lectures were held in the society both in German and in Hungarian. Its scientific activity was first restricted to the discussion of certain interesting cases. But from the middle fifties onwards, the interest had shifted gradually towards a more advanced type of medical research, based on scientific results, as was carried on in the more progressive Western countries. Still it was not before 1855 that the Society had improved its situation sufficiently to be able to hire new premises for regular lectures and raise its membership which at that time did not exceed 90.

A witness of the dark days, Frigyes Korányi, in 1882 described the situation as follows: "Those were strange times, even we who had been through it, can hardly believe they existed. The *Medical Review* had ceased to exist in 1848, and for a long while to come Hungary had no medical periodical at all, no organization, and no means of meeting in professional circles. We did not see each other, we did not hear about our medical aspirations, and we lived in complete darkness. For no fewer than nine whole years after 1848! For nine years at a time when

medicine was making tremendous strides forward, when men like Rokitansky, Skoda, Virchow, Dubois, Raymond, Cl. Bernard, Helmholtz, and a long line of other reformers were daily adding their best knowledge to modern science, we were left in the dark, knowing that every missed day only multiplied the task. There was no medical organ to tell us what was going on in the world of medical science, only rumours informing us about major movements abroad. To be sure, we could exercise our science at the university, but on one condition only, that it should not be Hungarian. It was left to us to choose: either to give up our national character, or to give up participating in progress . . . One professor was deprived of his right to lecture on account of his activities in 1848, another because of his religion, and a third because he had Magyarized his name" [12].

Political oppression had not spared the university either. Baron Károly Geringer, imperial and royal commissioner, entrusted with the civil administration of Hungary, deprived the university of its autonomous government on August 20th, 1849, and appointed a provisional university council, the first object of which was to purge. The chairman of the provisional council reported on the result of the purge in a confidential document on September 11th, 1849 [13] and, in due course, many outstanding professors lost their chairs.

Frigyes Korányi evidently could not rid himself of the sad impressions left on him by the events of twenty years earlier, and in the memorial speech held after Markusovszky's death, he said: "Silence and stagnation dominated in those days in Hungary, in every field, but most particularly in science; there was nothing, no scientific association, no literature. Only a few of us were informed about the epoch-making events in the life of medical science, partly from Hebra's Viennese periodical, partly from the *Prager Vierteljahrschrift*, and some French papers. All scientific aspiration at home was killed in the bud, or withered by itself for lack of contact, support, and chances for an exchange of views and collaboration" [14].

This was the state of affairs in scientific and social life when Semmelweis returned to his native town.

Semmelweis, Head of Department at Rochus Hospital

Stagnation in the medical and scientific life of Pest was the natural result of the political upheaval in Hungary. It would not have been surprising, under these circumstances, if Semmelweis had missed the scientific atmosphere he had left behind in Vienna, the clinic with its multitude of cases and his routine life. He could have felt lonely and desperate.

His spiritual isolation, on the other hand, did not last very long. Soon after his return he came in contact with medical men, especially János Balassa, Professor of Surgery, and the circle of his close friends. In the Hungary of those days, with all cultural life suppressed, this intellectual circle was of the utmost importance.



János Balassa

János Balassa had taken an active part in public life at the time of the revolution. He was courtmartialled, and in October 1849 sentenced to three months' imprisonment. The university students, and the citizens of Pest protested and he was released on November 23rd, 1849. But later, on May 1st, 1850 the university commission investigating past activities, deprived him of his chair, which was returned to him only by special royal amnesty in 1851.

During the period of national oppression he had exercised immense influence on the intellectual life of the country through medical men gathered around him. The "Balassa circle" included the best physicians of the time, who through social intercourse and a free exchange of opinion tried to make themselves viable in the void of scientific life. Among their gatherings the histological soirées of Ignác Hirschler were of great significance, with such men among the guests as: János Balassa, János Bókay, Lajos Markusovszky, Endre Kovács Sebestyén, Semmelweis, János Wagner, Sándor Lumnitzer, István Haynal, Károly Kanka, István Sass, Endre Lengyel, and many others [15].

Semmelweis was welcome in the company of these eminent scientists and enjoyed the sympathy and warm friendship they offered him [16].

Soon after his arrival home, Semmelweis spent one of his evenings in the company of many doctors, where probably due to his presence, the conversation turned to puerperal fever, and the question of the dangerous epidemic prevailing at that time in the lying-in department of Rochus Hospital.

On the following morning Semmelweis paid a visit to this department, which, actually, was not a separate department, but only a ward under the supervision of the head of the surgical department. The head of department made his daily rounds starting in the surgical division accompanied by his staff, and then proceeded to the obstetrical section with contaminated hands. The same doctors carried out the post mortem examinations since there was still no special pathological department [17].

Soon after this, on November 17th, 1850, Semmelweis sent a request written in Hungarian, to the regional sheriff of Pest–Buda, Ferenc Koller, asking the authorities to entrust him with the direction of the maternity ward of the Rochus Hospital. He was ready to perform his duties without pay, in an honorary capacity:

The Imperial and Royal Commissionar of Pest–Buda

Your Excellency,

Feeling sure that my modest request, based on no other interest than the advancement of science and the alleviation of the misery of the dying, will not escape Your attention, I have the honour of presenting my case. I hope it will please Your Excellency to entrust me with the direction of the lying-in ward of St. Rochus Municipal Hospital, which to the best of my knowledge is without special medical inspection, in no way prejudicing the regular hospital supervision. At the same time please appoint me physician to the said ward, thus enabling me to offer medical treatment to those who would come under my care.

In support of my application may I give you my particulars:

1. I was born in Buda, Hungary, and am a qualified physician, surgeon, doctor and obstetrical master, as proved by certificate submitted under No./. So far I have exercised my profession in Vienna, but I intend to settle down in my native country, particularly in this city, where I wish to practise medicine.

2. I feel myself qualified for this position in an honorary capacity, as by testimonials submitted under No. .//. in 1846 I was given an appointment as assistant in the 1st Obstetric Clinic of Vienna, and as evident from document No. ///., I filled that salaried position from April 7th, 1847 until March 19th, 1849, during which two years I worked in the clinic. My obstetrical work did not remain unknown to the medical world.

3. As seen in document submitted under No. .////., I obtained recently (i.e. in October of this year) an appointment as *Privat-docent* in obstetrics, recognized by the Imperial and Royal Ministry in Vienna. I did not begin to teach there having decided in the meantime to settle down in Pest.

4. I am prepared to fill the position referred to above *in an entirely unpaid capacity, for the benefit of science and of the hospital.* I declare myself ready to direct the affairs of the said lying-in ward accepting all the economic measures of the hospital and will do my utmost to keep down the necessary expenses.

May I repeat my above request, and beg Your Excellency to appoint me under the statutes and official regulations of the hospital, as *physician of the lying-in ward*, in an unsalaried capacity. In all my endeavours I shall try to show myself grateful and worthy of the trust placed in me by Your Excellency, and the municipal authorities.

Pest, November 19th, 1850

Your obedient servant
Dr. Ignác Semmelweis

The *Wiener Medizinische Wochenschrift* carried a notice in the first issue of 1851 to the effect that the well-known Dr. Semmelweis had been appointed *Privat-docent* in the University of Pest under Prof. Birly, to lecture on practical obstetrics for which purpose two rooms in the Rochus Hospital had been assigned to him. The notice which was dated from Pest, was in all probability inspired by rumours circulating in connection with the Rochus appointment.

Semmelweis received his appointment as unsalaried head of department from Geringer on March 12th, 1851 [19], but owing to difficulties on the part of the director of the hospital, he could not assume his duties before May 20th, 1851.

The Rochus Hospital was not undistinguished in the history of Hungarian public health and medicine, just like the Jesuit College in Új Világ Street, that housed the medical faculty for a hundred years from 1784 to 1884.

During the visitation of the plague in 1710–1711 emergency hospitals had been built in both Pest and Buda. The emergency hospital in Buda developed later into the old John's Hospital. The emergency hospital of Pest, on the other hand, was



The Rochus Hospital in 1867

pulled down after two years' existence. A chapel had been consacrated in 1711 on the place where the former emergency hospital had stood, named in honour of the "plague-ridding" St. Rochus. Adjoining the chapel, the alms-house with 75 beds was built from charity donations in 1784. The alms-house was again transformed into a hospital in 1796–1798, and received the name of St. Rochus Hospital.

In those days, the city of Pest had only one hospital, in the so-called Kecskeméti house on the corner of Zöldfa Street and Borz Street, with 72 beds. This was far from sufficient. Mihály Haffner, director of the hospital and chief city medical officer, addressed a memorandum to the city council on May 4th, 1793, urging the building of a new hospital [20]. It was due to his initiative that the alms-house was transformed into a hospital. Later it became the public hospital of the city of Pest *(Domicilium Pesthianum Calamitosorum)*.

The Rochus Hospital was opened amidst celebrations on May 29th, 1798. This institution, which was up-to-date for the times, had 271 beds, including 75 for the destitute, and 64 reserved for mental patients. Its staff consisted of one hospital superintendent, who was at the same time the chief medical officer of the city and director of the hospital, and one surgeon, who was responsible also for the lying-in section and for the autopsies, being at the same time city coroner [21].

The Rochus gradually developed into a large, modern hospital. In 1838 a new wing was added to it in Kerepesi Street (today: Rákóczi Street), and in 1860 another one in Flór Street (today: Stáhly Street). In the days of Semmelweis the

hospital disposed of 675 beds and 8 sections: 4 internal, 2 surgical, 1 dermatological, and 1 maternity section, the latter directed by Semmelweis [22].

With the appointment of Semmelweis, the maternity ward was turned into an independent section, completely separated from the surgical department. The new section could use its beds during ten months of the year for gynaecological patients only. During the university terms, the hospital was not allowed to take in lying-in women, in order not to attract them away from the clinic. On the other hand, during the vacations, in the months of July and August, when the clinic was closed, the hospital could take in all the lying-in women it had accommodation for.

The situation was different in Vienna, where most of the clinics worked within the larger hospitals. In Paris, all the hospitals were available for university teaching, but in Pest, because of the narrow-minded views of the city-council, Rochus Hospital could not be used as a teaching hospital. In the eighteen-fifties and many times in the following years there had been repeated proposals to turn the Rochus into a general university hospital, but the city authorities believed that curing and teaching activities were incompatible [23].

During Semmelweis's six years in the Rochus, 933 deliveries took place. Out of 933 cases, 24 died, but only 8 (0·85 per cent) from puerperal fever, with 16 other puerperae having been carried off by other diseases. This result was at that time amazing, as in Prague and Vienna the mortality rate of puerperal fever was still as high as 10–15 per cent.

About these years in Rochus Hospital, József Fleischer says in his memorial speech on Semmelweis: "Semmelweis soon discovered that the high mortality rate due to puerperal fever in Rochus Hospital was caused by the circumstance that the ward was an annex of the surgical department, whose chief also held the job of forensic prosector, and there being no prosector, all the autopsies were performed by the physicians of that department. The senior surgeon was accustomed to make his visit to the surgical cases, proceeding from there to the lying-in section. The doctors who made the examinations had unclean hands contaminated by decomposed animal matter of various kinds during the previous visit. From 1851 onwards, Semmelweis made it obligatory for every staff member to disinfect his hands before an examination. During his six years of office in the hospital there were 933 confinements, and out of these only 8 died of puerperal fever" [24].

Semmelweis remained at the head of the maternity department of the Rochus Hospital until June 13th, 1857, although he had also been appointed on July 18th, 1855 Professor of Obstetrics in the University of Pest [25]. He was reluctant to give up his position in the Rochus, because there he had a chance of studying gynaecological cases as well. The municipal council gladly supported him in his decision: Gynaecological studies in Hungary started with the establishment of the obstetric department in Rochus Hospital.

Finally Semmelweis had to resign. He was succeeded in the department by Ignác Rott (1812–1871), a general practitioner in Pest, who had addressed a request to

the minister of culture in Vienna, asking that a regulation should be introduced against the possibility of one person filling two positions, namely that of university professor and of senior physician. When the ministry granted Rott's request, the Presidential Council informed the city on May 23rd, 1856, that Semmelweis could not occupy a municipal and a state post at the same time [27].

To-day Rochus Hospital bears the name of Semmelweis. In 1934 the Medical Society of the Public Hospital placed a plaque on the wall of the hospital in order to commemorate his work there [28].



Memorial plaque in the wall of the Rochus Hospital (made by József Reményi)

Within a short time Semmelweis was actively engaged in the scientific life of Hungary. In the minutes of the meeting of the Medical Society in the month November 1850, he is mentioned as a "guest". He always visited the meetings, but he could not be admitted as a regular member before the following general session held on October 25th, 1851 [29]. In the same year he became a member of the Natural Historical Society which had again resumed its activity, in which he was also elected as a member of a special committee [30].

Semmelweis was a regular reader in the library of the Medical Society, keeping his eyes open all the time for any notice which might appear on the puerperal fever. We hear from Jakab Bruck that in the library "there are some volumes which still bear the traces of the feverish reading activities of Semmelweis, in the shape of notes and frequent ink-blots" [31]. We can find marginal notes in Semmelweis's handwriting in the 1847 volume of the *Neue Zeitschrift für Geburtskunde*, containing an article by Siebold, professor in Göttingen [32].

While busy in routine hospital and scientific work, Semmelweis was compelled to build up a private practice to make living. During the eighteen months he had been without employment he had eaten up most of his inheritance, and his unsalaried position in Pest had, of course, added nothing to his income [33].

Obstetrical and gynaecological private practice had so far been concentrated in the hands of Prof. Birly, and when he died on November 25th, 1854, his estate exceeded half a million forints, according to *Pester Lloyd*, a German paper edited in Pest (Dec. 8th, 1854).

One biographer in 1877 says that the private practice of Semmelweis had become so extensive that it left him no time to write [34]. It is true that his fame as an

Tage an, und nur wenig war die Person aus ihrem an Betäubung gränzenden Zustande zu ermuntern, aus welchem sie erst allmälig wieder erwachte, und während dessen sie genass. Während des Schlafs traten sehr löbliche Schweisse ein, und schon am 10ten Tage nach ihrer Niederkunft konnte sie mit ihrem Kinde das Haus gesund verlassen.

Noch war aber das Ende der in dieser Zeit herschenden Krankheit nicht gekommen. Eine am 9. März Niedergekommene blieb wohl, allein eine Wöchnerin, welche am 10. geboren hatte, ward am 5ten Tage nachher von heftigem Leibschmerz befallen, nachdem sie sich offenbar einer Erkältung ausgesetzt hatte. Bei dieser zeigte sich das Leiden mehr als eine Bauchfellentzündung, gegen welche vergebens örtliche Blutentziehungen in Verbindung mit dem innern Gebrauche des Calomels angewendet wurden. Sie starb am 20. März, und die Section zeigte einen ungeheuren Erguss in der Bauchhöhle. In der Substanz des Uterus wurden nur wenig Eiterpünktchen gefunden.

Vom 10. März bis zum 14. April fielen 17 Geburten vor: von den Wöchnerinnen erkrankten 3, von welchen aber nur eine starb. Auch bei dieser waren im Leben mehr die Erscheinungen der Bauchfellentzündung zu erkennen, welche am 3ten Tage nach der Geburt eingetreten waren; Aderlass, Blutegel und Calomel konnten den Tod nicht abwenden, welcher am 3ten Tage nach der Erkrankung erfolgte. Ein bedeutendes Exsudat in der ganzen Bauchhöhle ward bei der Section gefunden, der Uterus selbst war frei von jeder Theilnahme, namentlich zeigte sich in demselben kein Eiter.

Die beiden andern Wöchnerinnen, welche ebenfalls an Bauchfellentzündung erkrankten, wurden wieder hergestellt, ohne dass die Behandlung von der bisher eingeschlagenen abwich. Aderlass wurde bei beiden, bei der einen

Nein! Nein! von Siebold kann! Kindbettfieber kann durch keine venerische, oder

Semmelweis's marginal notes to Siebold's paper ("No, no Mr. von Siebold! Puerperal fever cannot be caused by any kind of venereal, or other, earlier, disease, but only by infection")

accoucheur had spread in the city and he had become popular and prosperous. Contemporaries and biographers agree that at all times he was governed by his professional convictions and in his attitude towards his patients he was dictated by a compassion for humanity. It is typical that, notwithstanding his extensive private practice, unlike Birly he died without leaving a fortune behind, although his death was unexpected, in early manhood, in the height of his activity.

During the period of absolutism only social means had existed for the propagation of the national spirit in Pest. Many of the social occasions, balls etc. were in fact patriotic demonstrations. On contemporary etchings we can see that the ballrooms were filled with men in national costumes, and with women wearing Hungarian national head-gears, bonnets and head-dresses. Semmelweis was never absent from these gatherings of the social world, but it is entirely untrue to maintain as some authors do that resignation and apathy, and the lack of professional activity made him throw himself into these "excesses".

What could prove better that he had not been failed in professional activity than the fact that he had kept up the closest contact with the eminent foreign representatives of his field, many of whom even visited him in Pest. In 1852 Semmelweis was visited by E.C.I. Siebold, the famous Professor of Obstetrics in Göttingen, and by S. S. Schultze, Professor of Midwifery in Jena University. We have a detailed account of his visit in Siebold's book [35].

Semmelweis was perfectly aware that conditions in Pest were not particularly favourable for the further elaboration of his theory and its practical application, and he tried to find a post more proportious for his work than the one he held. Hence, he applied for the vacant chair of midwifery in Prague, which had belonged to Wilhelm Lange (1813–1881) before he had been called to Heidelberg in 1851. Semmelweis, Johann Chiari and Hector Franz Arneth went to Prague to apply for the vacancy [36]. They were all three rejected on the ground that they did not speak the Czech language and Dr. Johann Streng received the appointment.

Semmelweis Appointed to the Chair of Obstetrics in the University in Pest

Professor E. F. Birly died on November 25th, 1854. The Minister of Public Education in the central Government of Vienna fixed February 20th, 1855 as the date for publicizing the vacancy caused by his death. There were seven candidates: Karl Braun, Bernhardt Pachner, József Pech, Ignác Rott, Ignác Semmelweis, Ferenc Walla and Ferdinand Weber.

Before the medical faculty of the Pest University could have taken a stand in the question of the candidature, the *Wiener Medizinische Wochenschrift* again published a letter, dated from Pest (February 1st, 1855), declaring that the university had agreed to the appointment of Semmelweis whose theoretical and practical training would open a new epoch in midwifery in Hungary [37]. Who the correspondent was has remained a mystery to this day.

F. 9x12

Löblicher Magistrat!

Da ich mangelnder Kenntnisse halber in der medicinal-Assistenz angestellten Concurs um Hofgnaden-Zeugniß bedürfte, so erlaube ich mir die Bitte, für Löblichen Magistrat wollen gütigst, wenn sonst, vorausgesetzt spätestens Freitag den 1. November 1850. mittheilen zu lassen, gefälligst polizeiliches Sittenzeugniß, um dasselbe Zeugniß gütigst beifolgen lassen.

Ergebenst
Prag am 31. Feber 1850.

Ignaz Semmelweis
Assistent am Hofgebärhause

Semmelweis's letter applying for a testimonial needed for the Prague vacancy

The medical faculty of the University of Pest discussed the candidates in a meeting held on March 20th, 1855. They were described as follows:

1. *Karl Braun.* Aged 31, deputy-director and *primarius* at Alle Laste, near Trient, in the Imperial and Royal Lying-in and Foundling Hospital. He has spent nearly 8 years in state service (4 years in the General Hospital of Vienna, in the obstetric clinic and as deputy head of department in the Vienna Lying-in Hospital. He has been in his present position since 1853. Braun has contributed to medical journals and has a basic knowledge of Hungarian (*"besitzt auch Vorkentnisse der ungarischen Sprache"*).

2. *Bernhardt Pachner*, Ritter von Eyensdorf. Aged 47, Professor of Obstetrics and *primarius* at Laibach. From 1831 to 1839 he was first assistant in the General Hospital, Vienna, a *Privatdocent* in obstetrics in Vienna University and Assistant Professor of Obstetrics. In Laibach he worked for a year in the chair of forensic medicine and veterinary science. Since 1842 he had been at the head of the department for paediatry. He has made literary contribution.

3. *József Pech.* Aged, 29, Chief medical officer at Schweinitz (Bohemia).

4. *Ignác Rott.* Aged 44, general practitioner in Pest.

5. *Ignác Semmelweis.* Aged 36, *primarius* in the Rochus Hospital. In 1846 he became assistant in the Obstetric Clinic of Vienna. His well-known discovery has received the recognition of the Academy of Sciences of Vienna, and he is considered capable of further research. Member of several medical societies.

6. *Ferenc Walla.* Aged 41, general practitioner in Pest, Assistant Professor in the vacant chair of obstetrics.

7. *Ferdinand Weber*, Aged 34, Professor of Obstetrics in the Surgical Institute of Lemberg.

In a secret ballot Braun came out first, Semmelweis second, and Walla third. Braun's appointment was subject to the condition that he must prove his mastery of the Hungarian language.

After the polling, Zsigmond Schordann, Professor of Physiology, introduced a rider that in an appointment such as this a knowledge of Hungarian should be required unconditionally. The university council, in agreement with the faculty passed it on unaltered to the Presidential Council of Buda, which before deciding asked for reports on the candidates from József Prottmann, chief of the police in Pest. In his report on the three Hungarian candidates (Rott, Semmelweis and Walla) Prottmann emphasized that Semmelweis was a respectable citizen, with an extensive obstetrical practice, suitable in every respect to fill the post.

The Presidential Council of Buda, on the other hand, did not endorse the motion of the medical faculty, but insisted that it was impossible to assume that anybody would be able to learn Hungarian in his adulthood. Only in the absence of a suitable able Hungarian candidate would it accept the decision of the medical faculty. Under these circumstances Semmelweis, with his European reputation and knowledge of Hungarian, was sure to qualify.

The same view was adopted by the civil and military governors of Hungary.

The Ministry of Public Education in Vienna shared the view that in the University of Pest a professor of midwifery could not lecture without a command of Hungarian. It was unprecedented to wait for somebody to learn the language, or use an interpreter at his lectures, when a man like Semmelweis was available who combined all the requirements to a supreme degree, including naturally the knowledge of Hungarian.

The final decision was passed accordingly and on July 18th, 1855 Semmelweis was appointed by the King, Professor of Theoretical and Practical Obstetrics in the University of Pest.

Semmelweis's appointment was eventually due to the intervention of Vienna. This was by no means to the credit of either the faculty or the university council even if we consider that in the period of absolutism the University of Pest, in want of qualified experts, had often been compelled to agree to the appointment of foreign professors, even though they had no knowledge of Hungarian.

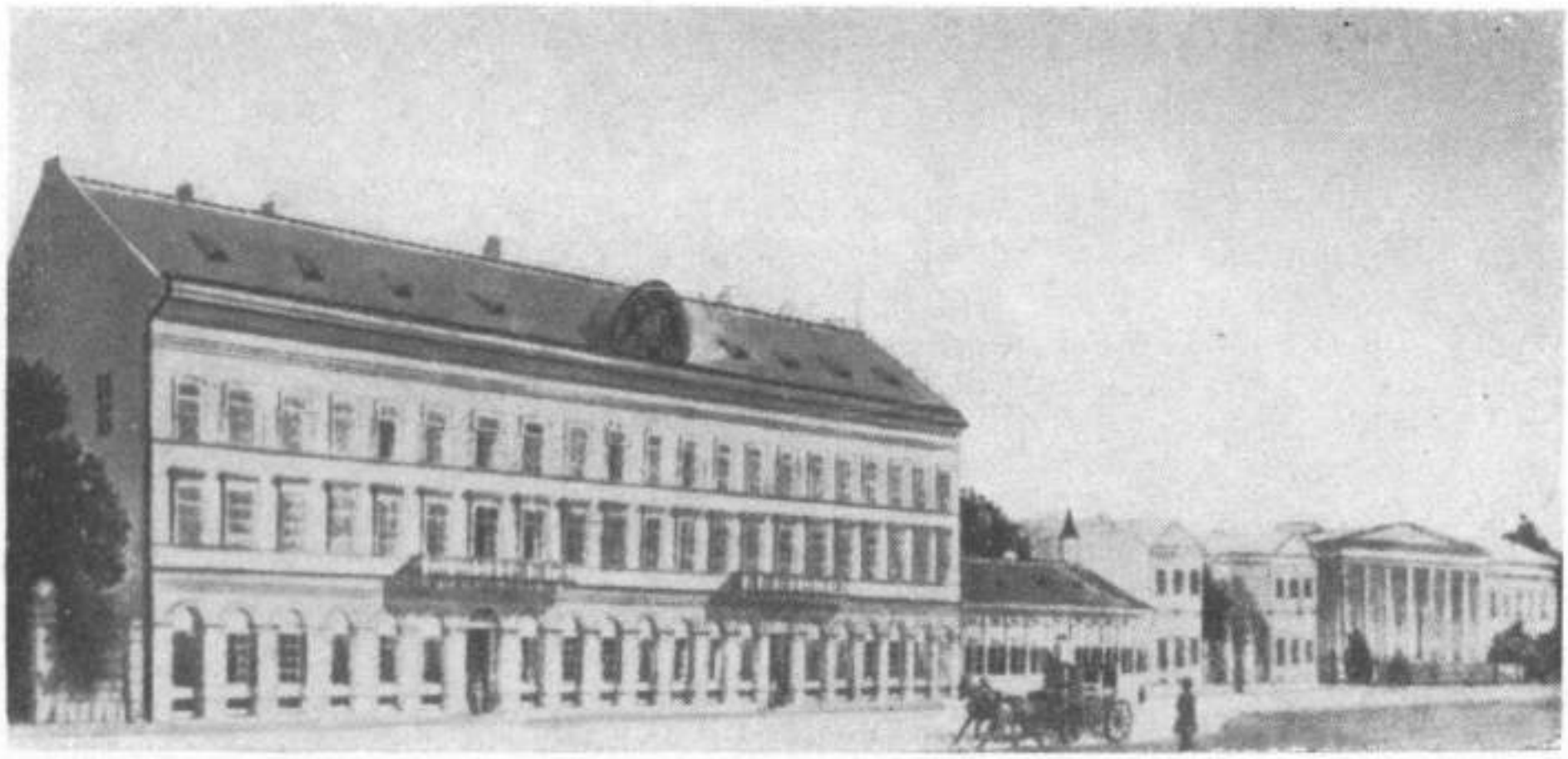
"It would be impossible to deny the fact, however shameful it may be", says Győry, "that though votes were by secret ballot, the medical faculty of our university did not give the first place for the vacant chair of midwifery to Semmelweis, but overlooked the great benefactor of mankind, the world-famous physician, giving preference to Karl Braun who did not even know Hungarian" [38].

Semmelweis took the official oath on August 27th, 1855, and occupied his chair on the 30th. He was filled with enthusiastic devotion, determined to make a success of his job. He believed that as the head of a university clinic, with plenty of cases at his disposal he would have a better chance of proving his theory. His energy, knowledge and character made him become an excellent professor, but he was faced with more obstacles than he had ever imagined. These difficulties were mainly linked up with the political and financial situation of the faculty as a whole. From the day of his appointment till his death, Semmelweis fought against overwhelming odds, trying to make his clinic more efficient, while offering high-quality, modern treatment to his patients.

Both in Vienna and in Pest, the university had been under government authority until 1848 with the ministry appointing a Director of Studies as its representative. This came to an end in 1848 by Act XIX, which granted the universities autonomous government. But, the Imperial and Royal Ministry of Public Education under Decree No. 401, dated Sept. 30th, 1849, concerning uniform organization in all the universities of the Monarchy, at the same time suspended the autonomy of the University of Pest, leaving it under the supervision of the Minister of Public Education in Vienna [39].

Previous to this decree, the imperial commissioner for civil administration, Baron Geringer had appointed on August 20th, 1849 the Professor of Criminal Law Antal Virozsil as chairman of the university council. The latter had been deprived of his chair by the revolutionary government of 1848, because he could not speak Hungarian. For the next twelve years, the University of Pest was not allowed to hold its yearly general meetings, or elect its own rectors and deans, who were therefore appointed by the imperial commissioner. For other universities of the Monarchy, Paragraph 44 of the *Studienordnung*, dated April 29th, 1850, stated that the management of university affairs as well questions of instruction should be placed into the hands of the faculties, with the ministry retaining merely its right of supervision.

Owing to the political situation, the financial affairs of the university were very insecure. The university clinics each having 6–12 beds were cramped into narrow



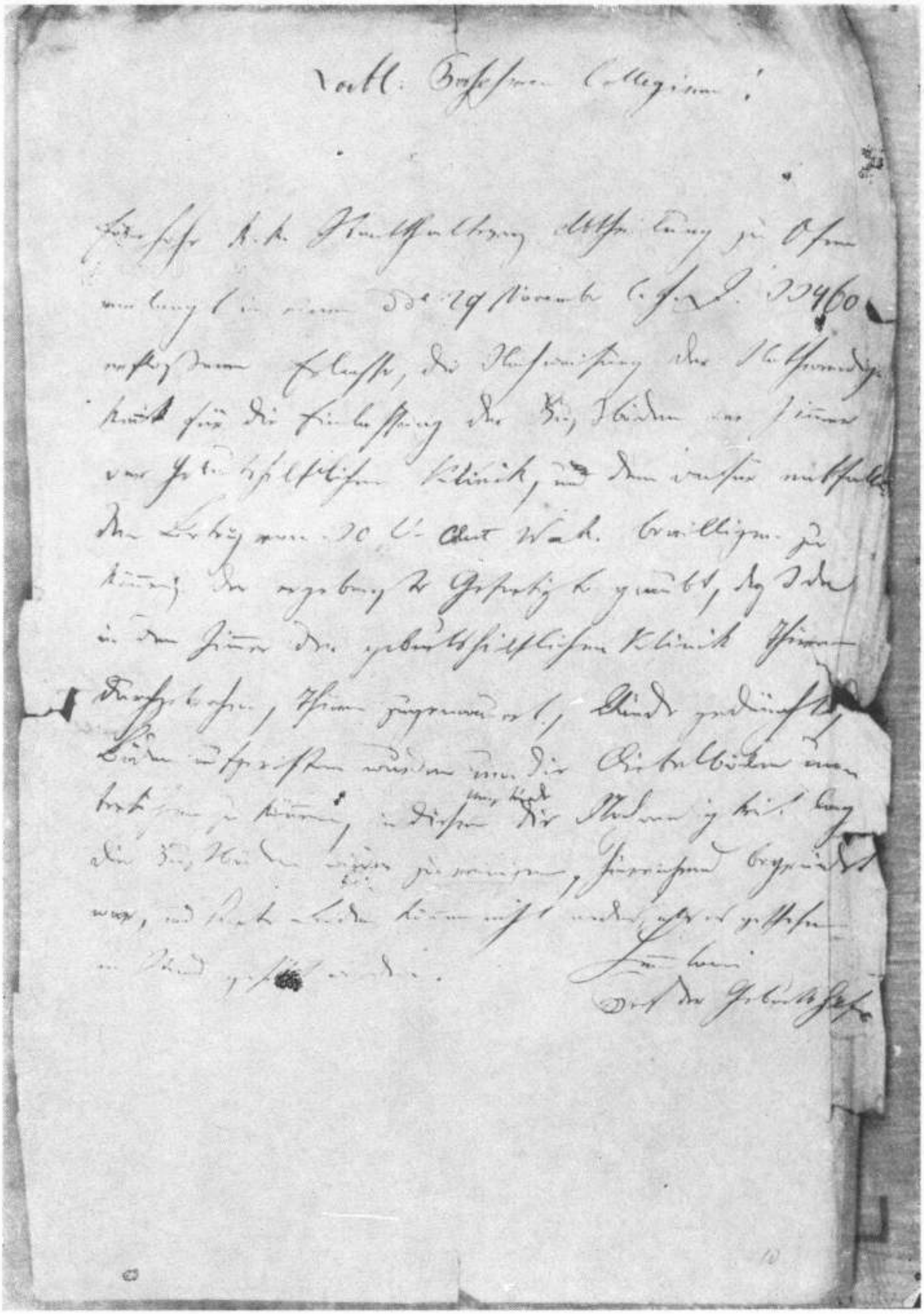
The Kunewalder house

and dark rooms, inadequate for either theoretical or practical instruction. The state of the medical faculty, of its clinics and collections was indeed deplorable.

The Obstetric Clinic of the university, the only lying-in hospital of its kind in the whole country, had at its disposal a labouring ward—with three beds and one window—and three wards for the patients, with altogether 26 beds. It was situated on the second floor of the one-time Jesuit college, with its windows overlooking a narrow back-yard. Below, on the first floor was the chemical department, and on the ground-floor, the dissection rooms.

The Obstetric Clinic had no lecture room of its own, and Semmelweis was obliged to lecture to his own students, the surgical students and the midwife pupils all crowded together in the corridors. In Vienna, the patients were admitted to the clinic during the last two months of their pregnancy, in Pest, however, they were not accepted before labour had actually started. The *Wiener Medizinische Wochenschrift* never stopped deploring the dreadful situation prevailing in the Obstetric Clinic of Pest [40].

Semmelweis had sent in report after report demanding that the clinic should be given better and more spacious accommodations, but he could not convince the responsible authorities that it was for the good of the patients and of the students. An outbreak of erysipelas epidemic in the surgical wards, however, brought the issue into the limelight. In 1859 all the patients in the 13 surgical beds of the clinic were down with erysipelas. There was a general outcry and the *Medical Weekly* on February 6th, 1856, under the headline "Erysipelas raging in the Surgical Clinic of Pest" wrote: "The old Jesuit building in Új Világ Street is objecting to the stress to which it has been subjected in the last 25–30 years. Unable to live up to the requirements of our age owing to its ancient, decrepit state, it is producing the plague, erysipelas, puerperal fever and other disease so as to demonstrate that time is ripe for a change".



Semmelweis's report about the 30 forints needed for the repair of the flooring of the clinic

Balassa and Semmelweis had been received in audience by Prince Albrecht, Governor of Hungary, who had on two previous occasions already discussed the question of a general university hospital. As a result of the audience, the Prince arranged for the Surgical and Obstetrical Clinics to be moved to another building in May 1859. The new premises were in the so-called Kunewalder warehouse in Országút (today Múzeum Blvd.), purchased by the university in April 1858. The Veterinary Department had been housed in the same building ever since 1851, and the physiological and chemical departments since 1858.

Semmelweis was naturally pleased that at last, after four years of suffering, his clinic was in a better position, but after having moved he soon found out that it was far from satisfactory. Twenty-eight beds of the Obstetric Clinic were on the second floor in lighter and more spacious wards than in Új Világ Street—it is true—but the arrangement was so unfortunate that the only entrance to the clinic led through the labouring ward and students, visitors, and whoever had any business there had to make their way through it. Obviously neither order nor cleanliness could be observed, the segregation of certain cases of particular importance to Semmelweis was impossible, etc.

Semmelweis was also seriously hampered by the meagre financial assistance of the economic authorities who were unwilling even to grant the necessary funds for the removal, and for the redecoration of the rooms [41].

The Obstetrical Clinic of the university remained in the Kunewalder house until 1879 [42]. Tivadar Kézmárszky, deputy director of the hospital from 1874 and professor from 1876, described the inadequate situation in 1871 in these words: "... anybody wishing to enter—students, midwife pupils, attendants carrying water, wood and food, private or official visitors—has to go through the same door into the labouring ward, empty or with labouring women in the beds, newborn babies being bathed and labouring women being operated on. Through this room are carried the bath tubs, the bed pans, empty and full, clean and dirty linen alike, steaming food and clattering crockery on trays, etc." [43].

It was not only the inadequacy of the arrangement that hampered Semmelweis in his work, but also the insufficiency of the equipment, the lack of instruments, unsuitable beds, shortage of linen, etc. In a memorandum addressed to the medical faculty on January 25th, 1856 and to the Presidential Council on April 24th he called their attention to the danger inherent in the lack of adequate bed-clothes, insisting on more linen, sheets, and equipment. He evidently could not have met with much success since he appealed again and again, addressing memoranda to various authorities.

In a document No. 32.571/1856-VI. a., dated November 29th, 1856, the Presidential Council ordered the head of the rector's office of the university, Antal Virozsil, to investigate the situation in the Obstetric Clinic and report urgently back to them. In his report dated December 14th, No. 236, Virozsil said that he had visited the Semmelweis clinic in the company of Ferenc Gerhardt, dean of the medical faculty, and had found that 100 sheets were urgently required. He also stated that these sheets had been urgently needed by the late Prof. Birly, and that the university could afford to buy them at the moment from its spare funds.

At the suggestion of the university council, the Presidential Council ruled that the sheets required by Semmelweis should be purchased at once.

In another report, dated December 19th, 1856, No. 221, Virozsil also approved of a further request made by Semmelweis concerning readjustment in the clinic. He further stated that he did not feel that the situation should be considered as remedied, and that Semmelweis had further wishes. Apart from the 100 sheets, he demanded that other requirements in linen should be supplied. As regards the linen situation, Semmelweis always had something to worry about.

In the summer of 1856 the Presidential Council of Buda complained that the laundry bills of the Obstetrical Clinic for bed-clothes and linen had been constantly rising. By tender the cheapest laundry had to be engaged, and they succeeded in reducing the monthly laundry bill from 105 forints to 69 forints 54 krajcár. Semmelweis seeing that, after the initial good results, puerperal mortality had begun to increase again, naturally attributed it to the shortage of linen and to the cheaply and badly laundried bed-clothes. He emphatically put the blame on to the new laundry system introduced in the clinic in 1856, and infuriated, he had the badly washed and filthy sheets produced in the presence of presidential councillor, Joseph Tandler, who was responsible for the new scheme. Nor was the proprietor of the laundry satisfied, because the laundry list was constantly growing as the bed-clothes were being changed more frequently than permitted by the regulations [44].

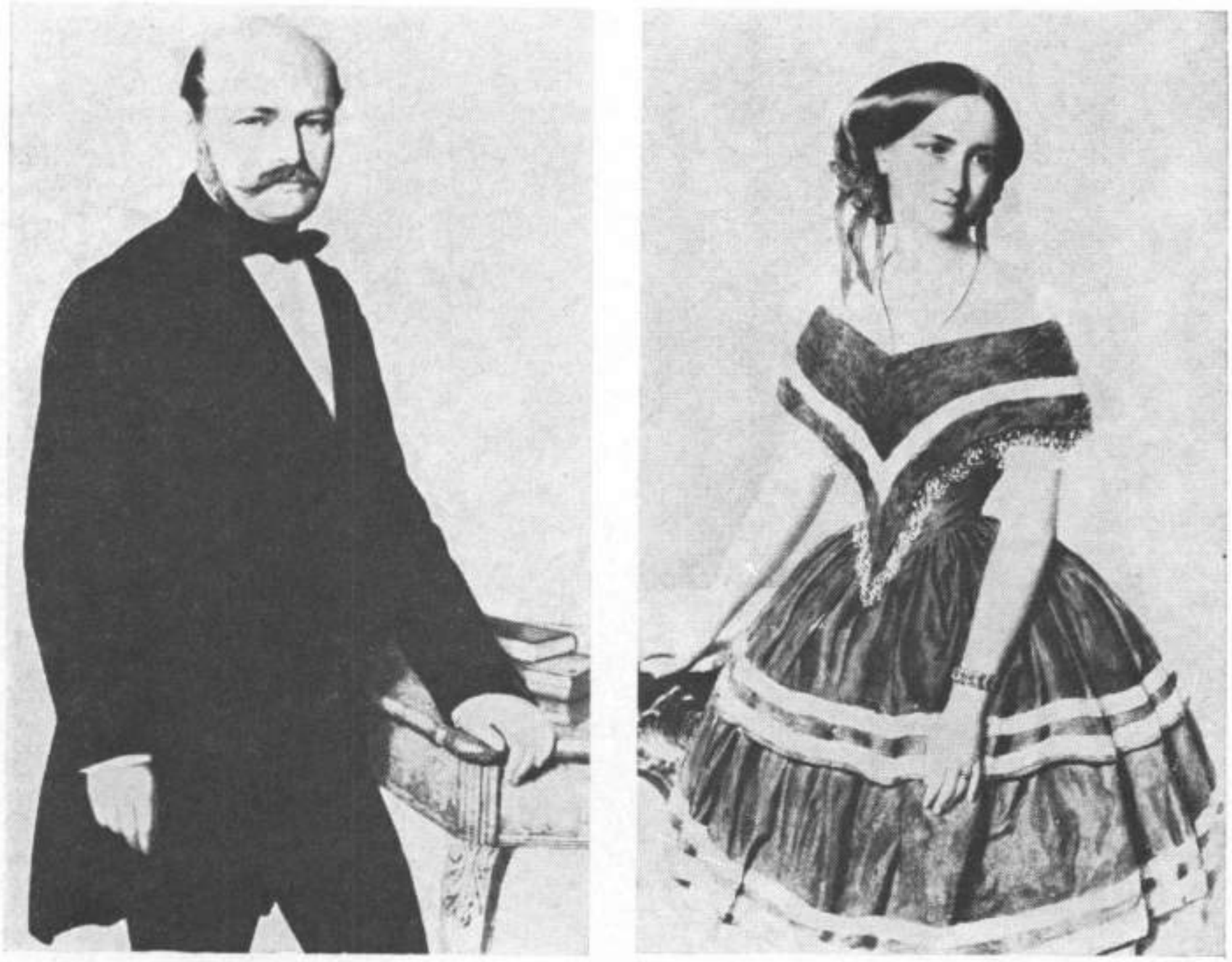
Semmelweis produced new documented memoranda, only to be rejected by Tandler. Nevertheless later the clinic was given 300 new sheets, and more funds for new equipment in 1857. Furthermore the new laundry arrangement having proved inadequate, was replaced by the old system once again.

In spite of these difficulties, in the first stage of his clinical work, in the academic year 1855–56, Semmelweis achieved excellent results. Of the 514 childbed patients only 2 were carried off by puerperal fever, showing an incredibly low, 0·39 per cent, mortality rate. The results of that year boosted the prestige of the Rochus Hospital considerably.

The honour of being invited, as Semmelweis was, to Gross-Selowitz (near Brünn, today Brno) to assist at the accouchement of Palatine Joseph's daughter Elizabeth must have been due to his fame, for it was exceptional that a Hungarian obstetrician and not one from Vienna or Prague should be asked to be present at the birth of a member of the Hapsburg family [45].

Yet Vienna was nonetheless hostile towards Semmelweis. In 1856 one of his assistants, József Fleischer sent a report on the good work of the Obstetrical Clinic of Pest to the *Wiener Medizinische Wochenschrift* and the editor had nothing else to remark about the article than that it was high time to stop all that nonsense about the chlorine handwash [46]. No one can say what had caused this change of heart, but it is a fair guess to attribute it to Karl Braun, who was becoming more and more influential in Vienna.

The sarcastic remark of the editor did not affect Semmelweis so much as the situation in connection with the obstetric chair in the Vienna University, vacant as a result of the death of his former chief, Professor Joseph Klein. Semmelweis



Semmelweis and his wife

did not figure beside Karl Braun, Joseph Späth and Eduard Lumpe among the candidates of the medical faculty of Vienna.

In 1918 Max Neuberger had the following to say about the omission: " . . . Vienna had withdrawn the proper sphere of activity from the discoverer, the benefactor of mankind . . . it had felt compelled to cede the honour to Pest, as the seat of Semmelweis's researches and the starting point of his revelations" [47].

The fact remains that although a delegation of six medical specialists headed by Prof. Dumreicher tabled their disapproval with the Minister of Public Education and asked him to appoint Semmelweis, it was without any effect.

Marriage

1857 was a most significant year in the life of Semmelweis. His engagement was in February and at the age of 39, and on June 1st of the same year he married Mária (Eleanora, Antonia, Franciska) Weidenhoffer (1837–1910), daughter of Ignác Weidenhoffer, well-to-do merchant (*ligularum questor*) in Pest, and Mária Walthier. She was then 20 years of age. The wedding was held in the Parish Church of Krisztinaváros district in Buda, with the bridegroom's brother, Dr. Károly Szemerényi, rector of Esztergom, officiating. Antal György Walthier,

citizen of Pest, landlord, the bride's uncle, and Konrád Adolf Hartleben, well-known publisher and bookseller in Pest, signed the register as witnesses [48].

Out of the five children from the wedlock, two died in infancy, two days, respectively four months after birth.

1. Ignác S., died on October 16th, 1858, aged two days (Not baptized), Pest-City.

2. Mária Gabriella Antónia, S., born November 22nd, 1859, died March 16th, 1860, Pest-City.

3. Margit Antónia Adél S., born May 8th, 1861, Pest-City, died April, 1928 (Szemerényi, 1879. 54 684 M. I.).

4. Béla Antal S., born November 20th, 1862, Pest-City, committed suicide Sept. 14th, 1885 (Szemerényi as above).

5. Antónia of Padua Mária Auguszta S., born July 26th, 1864, Buda-Krisztina-város, died November 1942, married Kálmán László Lehoczky November 4th, 1882 (Szemerényi as above).

Through his marriage Semmelweis enjoyed the happiness of married bliss as well as a solid financial background. Until his death the couple were happily married. Semmelweis adored his wife and children and never let disappointment and failure interfere with his family life, safeguarding its peace and harmony.

Invitation by Zürich University to Chair of Obstetrics

1857 was marked by another cause of happiness: in August the University of Zürich invited him to the vacant chair of obstetrics. The *Medical Weekly* in its January 2nd, 1858 number gave the following account of this event: "Professor Semmelweis has been offered the chair of obstetrics in the University of Zürich and the directorship of the lying-in hospital. The invitation of the famous university arrived accompanied by a flattering letter addressed to our professor from the renowned physiologist and chemist, Professor Moleschott. We are overjoyed by this public recognition of his merits, but hope that he will remain loyal to our university and merely send his thanks for the honour of being invited by them" [49].

The daily paper, *Diary of Pest (Pesti Napló)*, in the "Miscellaneous" column in its January 26th, 1858 issue gives an account, evidently from similar sources, in the following words: "Our university is being honoured from several quarters. We are pleased to record that . . . this time the honour has been bestowed on a man, who fills the chair of midwifery, equally known at home and abroad. He has just received an invitation to a chair in Zürich University. The invitation is signed by the great natural scientist, Prof. Moleschott. As much as we are pleased with this honour, we are happy to record that this great man has refused the invitation. We are also glad to report that the lectures of Dr. Semmelweis on puerperal fever (*febris puerperalis*) are arousing the same interest in the medical circles of Pest as among specialists abroad. His lecture held at the February 23rd

meeting of the Medical Society of Pest–Buda was followed by the reading of extracts from the letters of the greatest authorities on the subject, who describe their observations and experiences to Dr. Semmelweis. The proceedings of the lecture will be published in full in the *Medical Weekly*."

In the History of the 100-year-old University of Zürich the following account of the invitation is given: "The director of studies, Dr. Dubs, offered the chair with the authorization of the faculty, at Rokitansky's suggestion, to Karl Braun of Trient, who did not accept it. At the same time, an invitation was addressed by Moleschott to Dr. Semmelweis in Prague (!). As a matter of fact, this was the only invitation from abroad to that controversial reformer of midwifery. Nevertheless also he declined it" [50].

The circumstance of the invitation is repeated by Theodor Wyder, Professor of Obstetrics in Zürich and also by Siegerist, in these words: "He declined the invitation of Zürich, not wanting to leave his native town" [51]. The invitation is similarly recorded by Tibor Győry [52]. After Semmelweis's death it is also referred to by György Schopper, then rector of the University of Pest, in his petition to the Presidential Council in the matter of a pension to be granted to the widow of Semmelweis (see below).

W. L. Brunn (Stuttgart) on the other hand maintained that the invitation could not have been true, there being no trace of it either in the annals of the university or in the records of the educational authorities [53]. Nor did Moleschott in his autobiography concerning life in the universities of Heidelberg, Utrecht and Zürich make any allusion to his role in connection with Semmelweis and the invitation to Zürich. Evidently the incident of the letter written on behalf of the director of studies was of lesser importance to him than it was to Semmelweis and his university. Nevertheless we have no reason to doubt that the invitation did take place. Why should we disbelieve contemporary articles written immediately after Schopper's testimony and a book containing the history of the University of Zürich?

It remains an uncontested fact that Semmelweis declined the invitation however flattering, preferring the miserable conditions of his own country.

The "Instructions"

His first year in the clinic was very promising as regards low mortality from puerperal fever. The 1856–57 academic year, however, caused Semmelweis much distress, because mortality rose to 2·90 per cent. The following year was even less favourable, with a mortality rate of 4·05 per cent. These figures were all the more alarming as he had intended to prove in his own clinic the validity of his theory and its effectiveness. He was particularly worried about these results because he feared that confidence in his work would decrease. A study of the upward mortality trend forced him to the conclusion that in the first of the two bad years the cause must have been in the badly washed bed-clothes, and in the following year, the infection was due to the carelessness of the nursing staff.

The increase in puerperal mortality shocked also the superiors of the clinic, and in 1858 Semmelweis was officially reprimanded. The letter contained the following accusations: "Confidential information has reached us concerning several unfortunate occurrences and abuses at the Obstetric Clinic of the Imperial Royal University. It is alleged, for instance, that through the negligence of the head-midwife, the bedding of lying-in women is very seldom changed, and that even bed-clothes soaked with the blood of dead puerperae are placed under patients who have just been admitted, and that, in consequence of all this, the mortality at the beginning of this current year reached such a high level that ten lying-in women have died in one day.

"The fact is all the more remarkable since last year with a much lower mortality rate the Professor applied for, and obtained, a substantial grant of money in order to enable him to fulfil all his duties in respect of bed-linen. All this was done with lavishing expense, and many hundreds of sheets were supplied. Bedsteads and other linen have been placed at his disposal in large quantities in the academic year and during the vacations. So much so that the high expenditure did not escape the attention of the Ministry of Culture and Education.

"The Imperial Royal Professor appears to share the opinion of other people who have visited the Clinic that the responsibility for the increased amount of sickness and mortality should not be attributed to the want of linen, nor to the irregularity of its delivery by the laundry, but to the carelessness and irregularity with which the bed-linen is changed by the nursing staff." Semmelweis answered at considerable length: "I do indeed share the view of the persons referred to who appear to know that in the clinic the high mortality at the beginning of the academic year 1857–58 cannot be attributed to the want of linen nor to irregularity in delivery, but rather to the wanton carelessness and irregularity with which the bed-linen is changed by the nursing staff.

"However for this irregular and careless practice not the head-midwife, but Nurse N. N. was to blame, and she has been immediately dismissed by me in consequence.

"We never gave the blood-soaked bed-linen of dead puerperae to newly arrived patients, unless you mean the badly washed sheets of 1856–57, in which year we received linen soiled with blood and other discharges back from the laundry as if they had been cleanly washed. I have taken pains to produce those sheets and describe them in my report, insisting that puerperal mortality in my clinic was then caused by them."

The closing statement which shows much courage contains these words: "From the time of Hippocrates until very recent years it was the undisputed opinion of the medical profession that the frightful devastation caused by puerperal fever must be ascribed to epidemic, that is to say, to atmospheric influences. These influences assumed to be beyond the control of the medical profession, exercised their devastating influence unrestrained. It was I who in the year 1847 at the great lying-in hospital of Vienna succeeded in proving that these opinions were erroneous, and that every case of puerperal fever was the result of infection.

Owing to the measures that I employed there, no epidemic occurred in any of the three institutions. During my 21 months service in Vienna, 6 years in the Rochus Hospital, and one year in the clinic in Pest there has been no sign of it in any of the institutions with which I have been connected, which used to be visited every year by the most frightful epidemics.

"The two unfortunate years following this, however unwelcome, should serve as tragic examples of the correctness of my theory on the cause of puerperal fever, which I had the honour of expounding in the *Medical Weekly*.

"My discovery of the cause of puerperal fever has been compared in its beneficial effects to the introduction of vaccination for the prevention of smallpox. I am painfully conscious of how unbecoming it is of me to speak in such terms about myself; but the fact that my clinic has been attacked by allegations of a high death rate compels me to stand up in my own defence. This will necessarily place the mortality at the Obstetric Clinic of Pest which occurred owing to no fault of mine, after nine years' brilliant success, in a more favourable perspective" [54].

The unfortunate incident had by no means discouraged Semmelweis in his daily work. Within a short time he had established a rigid discipline. In the 1860–61 academic year there was not one single case of puerperal fever in his clinic.

In October of the same year, however, at Karl Braun's clinic in the General Hospital of Vienna there were 113 cases of puerperal fever, 48 of which were mortal, and in November again 48 died out of 253.

The new outbreak of puerperal fever caused serious concern in Vienna, and the daily press discussed the occurrences. The directors of the General Hospital introduced serious preventive measures, one of which was the discontinuation of the courses for foreign physicians. Karl Braun did not permit medical students to carry out any examinations, and at the explicit order of the Imperial Court, he had been forced, even though for a short period, to re-introduce the chlorine handwash. Owing to the renewed outbreak of the puerperal epidemic throughout Europe, many lying-in hospitals closed their gates, e.g. in Paris.

Semmelweis was fully conscious of the fact that if he intended to maintain his good results caution and vigilence were necessary. Consequently he drafted stringent rules for medical students and for midwife pupils, which had to be carefully followed to prevent puerperal fever.

Instructions to be observed by students and by midwife-pupils in the Obstetric Clinic of the Royal Hungarian University of Pest for the prevention of puerperal fever.

"Puerperal fever mostly develops when students and midwives examine the lying-in patients with fingers previously soiled by putrid animal material. The soiling of the fingers can come *about from contact with putrid cadavers, with childbed patients producing decomposed* discharges, and from surgical or gynaecological cases where the physician touches similar materials.

Consequently, physicians dealing with cadavers or any of the above cases should not be allowed into the lying-in section of the Obstetrical Clinic, neither the assistants engaged in

Utasitvány

a pesti m. k. egyetemi, szüleszeti korodán tanulo es tanulónők részére, a gyermek ágyi-láz elhárítása végett.

A gyermek ágyi-láz legnagyobb részben akkint származik, hogy tanuló és tanulónők szétbomlott állati anyaggal bemocskolt ujjal vizsgálják a szülőnőket. Az ujjak ilyetén bemocskolása történik, ha a vizsgálók rohadt hullával, bomlott állati anyagot termő gyerek-ágyasokkal foglalkoznak, vagy az orvos-sebészi köteg, nő-gyógyászati kórodákon hasonn-termenyü kóreseteket kezelnek.

Ennek következtében oly orvosok, kik hullával, vagy a fennemlitett kóreseteklel foglalkoznak, a gyakorlati szülészetre fel nem vehetők, ilyenek p. o. a leiró és kór-boncztan segédei, a sebészeti kórodák és osztályok segédorvosai, a mütő növendékek stb.

A gyakorlati szülészet-tanuló és talnuónői kötelezetnek, minden vizsgálat előtt és után, kezeiket a szülteremben kihelyzett chlor-olvadékban addig mosni, mig azok sikamlóssá nem váltak.

A mosások nem kellő teljesitői a szülészeti tanfolyamról eltiltatnak.

Miutan a szülészek és szülésznők magán-gyakorlataikban el nem kerülhetik, hogy bomlott anyagot szolgáltató betegekkel erintkezésbe ne jöjjenek, azért nekik szorosan javaltatik, hogy minden szül-vizsgálat előtt s után kezeiket chlor-olvadékban szorgosan megmossák, nehogy ennek elmulasztása által a gyermekagyi-láz kitörésére okot adjanak.

Pest, május 27 én 1861.

Semmelweis Ignácz.

The "Instructions"

Verhaltungsregeln

für die Schüler und die Schülerinen der praktischen Geburtshilfe an der geburtshilflichen Klinik der kön. ung. Universität zu Pest, zur Verhütung des Kindbettfiebers.

Da das Kindbettfieber in der überwiegend größten Mehrzahl der Fälle dadurch entsteht, daß die Schüler und Schülerinen mit Fingern untersuchen, welche in Folge gemachter Sectionen, oder in Folge von Berührung von Leichentheilen bei Sectionen verunreinigt sind Und da dieselbe Verunreinigung der Finger entsteht, wenn die Schüler und Schülerinen kranke Wöchnerinen berühren, deren Krankheiten zersetzte Stoffe erzeugen, oder wenn die Schüler auf medicinischen und chirurgischen Kliniken, oder auf medicinischen, chirurgischen Ausschlags- und Gynaecologischen-Abtheilungen Kranke berühren, deren Krankheiten zersetzte Stoffe erzeugen; so wird den Schülern und den Schülerinen während der Dauer des praktisch geburtshiflichen Curses eine derartige Beschäftigung verboten.

Demzufolge sind von der Aufnahme in den prakt. geburtshilflichen Curs alle jene Aerzte ausgeschlossen, zu deren Berufsbeschäftigungen es gehört, sich mit Sectionen und mit Kranken zu befassen, deren Krankheiten zersetzte Stoffe erzeugen; hieher gehören; die Assistenten der elementaren und pathologischen Anatomie, die Assistenten der chirurgischen Klinik, Operationszöglinge, chirurgische Secundarärzte, etc.

Die Schüler und Schülerinen des praktisch geburtshilflichen Curses sind gehalten, vor jeder und nach jeder geburtshilflichen Untersuhung, sich die Hände in dem auf dem Kreißzimmer vorhandenen Chlorwasser so lange zu waschen, bis die Hand schlüpfrig wird.

Die Strafe für nicht geübte Waschungen ist Ausschließung vom praktisch geburtshilflichen Curse.

Da die Schüler und Schülerinen in ihrer künftigen selbstständigen Praxis es nicht werden vermeiden können, mit Kranken in Berührung zu kommen, deren Krankheiten zersetzte Stoffe erzeugen, so wird ihnen hiermit schärfstens eingeprägt, auch in ihrer künftigen selbstständigen Praxis die Chlorwaschungen vor jeder und nach jeder geburtshilflichen Untersuhung zu üben, um das Unglück, welches durch Unterlassung der Chlorwaschungen entstehen würde, zu verhüten.

Pest, den 27. May 1861.

Semmelweis,

o. ö. Professor der Geburtshilfe an der kön. ung. Universität zu Pest.

Verhaltungsregeln, German version of the "Instructions"

elementary and pathological anatomy, nor the assistant physicians of the surgical department, nor the staff of the operating theatres, etc.

Pupils of midwifery, male and female, before and after each examination must wash their hands in the chlorine solution available in the lying-in room, until they find them smooth and slippery.

Anybody who does not submit to this rule shall be forced to discontinue his studies in midwifery.

Since midwives, male and female, cannot prevent their hands from becoming soiled with organic matter in their private practices, they are required to wash their hands most energetically in the chlorine solution before any obstetric examination, so as not to be responsible for the outbreak of puerperal fever.

In Pest, on May 27th, 1861

Ignácz Semmelveis
Professor of Midwifery

The sheet-anchor of Semmelweis's teachings was the observance of the chlorine handwash and general cleanliness. He kept the closest watch over his clinic's staff and students, requiring them to observe his rules which were based on the modern principle of *non infectio*.

Professorship

In most universities of the Monarchy lectures were generally held in one language only. Lectures were held in German in Vienna and Prague, in Italian in Pavia and Padova, in Polish in Cracow. In the University of Pest, however, considerable difficulties were caused by the fact that lectures could be held in three languages: Latin, German and Hungarian.

Only the German professors of the natural sciences delivered lectures exclusively in German. In two-hour courses the professors of anatomy, surgery, obstetrics and pathology lectured alternately for one hour in Hungarian and for one hour in German. Physiology and medical lectures were always held in Latin, whereas ophthalmology lectures were held alternately, one term in Hungarian and the other in German.

There were several reasons to account for this intricate arrangement. The German professors insisted that Latin being a dead language, was no longer suitable as a medium for the ever-developing sciences. The Hungarian professors, on the other hand, knowing that Hungarian had not evolved to a point where it contained subtle distinctions, preferred, for patriotic reasons, to lecture in Latin rather than in German. There was no medical language to speak of, as in those days Hungarian lacked technical terms. In the eighteen-sixties the only technical Hungarian language in existence was what the professors of the lower surgical course, Sámuel Rácz, Ferenc Gebhardt and Pál Bugát had themselves coined.

Specialization in medical and natural sciences did not start in Hungary before the first decades of the nineteenth century, when Hungarian words relating to the various medical branches made their first appearance, proving that they were beginning to become independent.

Pál Bugát (1793–1865) who held courses for surgeons on theoretical medicine had taken notes in obstetrics as a medical student, in which we find obstetric terms in Hungarian for the first time [55]. Already in Lajos Csirke's small handbook on obstetric surgery, published in 1837, there are a good many Hungarian obstetric terms [56].

It was not easy for the Hungarian professors, brought up in the Latinist–German culture of Vienna, to develop a Hungarian technical language and to find adequate medical terms in Hungarian. Even János Balassa, though of pure Hungarian descent, found great difficulty in expressing himself in his native language when delivering a surgical lecture and in finding the right technical expressions. So much so that his lectures were dull and slow-going. It could not have been much easier for Semmelweis who made his studies in Vienna in Latin and German.

Semmelweis had no difficulties in speaking Hungarian fluently, although his intonation showed clearly that he was a Swabian of Buda. However, his main problem was not the lack of technical terms in Hungarian, but another peculiarity of obstetric teaching, namely that lectures were meant for students on different levels. We must remember that a large number of these had been midwife pupils. Most of them, as all over Europe, had come from the lowest layers of the population, almost illiterate, attending the courses without any preliminary schooling.

From an average of about 200 students a year who attended the lectures of Semmelweis, 150 were midwife pupils. Since obstetric lectures were not compulsory for the medical students, most of the remaining 50 were students of surgery.

We find the name of Semmelweis in the university syllabus for the year 1855–56 for the first time. He would lecture in Hungarian on theoretical midwifery, and alternately in Hungarian and German, on practical midwifery. In 1859–60 he announced special lectures on gynaecology and a course entitled *De febri puerperali*, both in Hungarian.

The university syllabus appeared for the first time in Hungarian in 1862 [57]. For that year Semmelweis is posted for lectures on theoretical midwifery in German and practical midwifery in German and Hungarian. A special lecture in German is advertised for the surgical course.

For many years Semmelweis gave public lectures on women's diseases. Beside him, free lectures were held by Ferenc Bene, Lajos Arányi and others. These university extension courses enjoyed great popularity. We can in fact say that it was the University of Pest which started the idea of extramural studies, as early as in 1858.

Semmelweis, who had lived a retired life before his professorial appointment and had even restrained from publishing his results, with the beginning of his clinical work started to concentrate his efforts on research and publication.

In 1856–57 he delivered four lectures in the Medical Society on the following subjects: "Spontaneous amputation of the foetus caused by amnion fasciculi." "Caesarean section performed on a woman suffering from rickets." "Parturition

in a case of water cyst of the ovary." "A rare case of funnel-shaped protuberance of the cervix of the pregnant uterus."

A detailed report on these lectures was published in *Wiener Medizinische Wochenschrift* [58].

The *Medical Weekly* started its publications in 1857. Between 1861 and 1865 Semmelweis contributed five articles as follows: "The extirpation and regression of fibrous uterine tumour; normal pregnancy." "Seven months' pregnancy with exceptionally large fibrous growth in the uterus." "New and old theories concerning menses." "Normal and abnormal menses." "Surgical management of ovarian cyst" [59].

In the last mentioned article Semmelweis described the first ovariotomy performed in Hungary on June 22nd, 1863, with himself operating and Prof. Balassa acting as his assistant. The second part of the article which would have contained the actual description of the operation was never published.

István Báthory, János Maixner, József Fleischer and Ferenc Kreutzer, lecturers at his clinic, sent regular accounts of the work of the clinic to the *Medical Weekly*, to *Ungarische Chirurgische Medizinische Presse* and to *Wiener Medizinische Wochenschrift*. One article written by József Fleischer deserves special attention because it describes a caesarean section performed by Semmelweis on a woman with a narrow pelvis and the embryo with a breech presentation. The operation was performed on March 18th, 1857.

Semmelweis played an active part in starting the *Medical Weekly* which first appeared in 1857. In the days of national oppression, the appearance of a medical journal in Hungarian was an unprecedented event. Famous members of the Balassa circle, the eminent physicians of the time, such as János Bókay, Ignác Hirschler, János Wágner, Frigyes Eckstein, Sándor Lumniczer, Károly Than and, last but not least, Ignác Semmelweis contributed regularly to it.

From 1864 Semmelweis even edited a supplement of the *Medical Weekly* entitled *Gynaecology and Paediatry*.

He also worked on a handbook on obstetrics. The *Medical Weekly* announced in its November 11th, 1860 issue that Semmelweis had made a certain amount of progress with his handbook. On two successive occasions the journal referred to the work as being in progress: "Ignác Semmelweis, Professor of Obstetrics is busily engaged on his handbook written for experts, which will come out well produced, with numerous illustrations inserted, in an edition which will rival the best of its kind published abroad, to the credit of Hungarian workmanship" — "Some of the woodcuts (100) of the illustrations in Prof. Semmelweis's Obstetrics have been prepared, and we hope that the completed handbook will soon be available on the Hungarian book-market. The woodcuts (altogether 180) have been made by Mr. Russ, the eminent Hungarian artist, in the French style, and are of such exquisite workmanship that they will vie with the best woodcuts of the Braunschweig master, Vieweg" [60].

Unfortunately Semmelweis does not seem to have completed his work and the manuscript could not be traced after his death.

In addition to his clinical and scientific work, Semmelweis played also an active part in the life of the medical faculty. He did not disappoint those who looked with anticipation towards his presence in the faculty. The lively young man, with his teeming energy brought with him a new spirit and his activities extended to various fields in university life.

He became a member of the committee which under Prof. Balassa completed in 1861 a reform scheme for better instruction for medical students. Other members of the committee were: József Lenhossék, Gáspár Lippay, Tamás Stockinger and János Wágner. On July 31st of that year the committee submitted a detailed plan for reform including, among other points, the proposal that obstetrics should be made compulsory.

Semmelweis was an active member of still another committee which fought for years to introduce a satisfactory scheme for the centralization of all university clinics and hospitals. After several unsuccessful attempts, the medical faculty sent Czermák, Diescher and Semmelweis in deputation to Vienna to present a memorandum of the university clinical centre to the Ministers of the Interior and Public Education. As a result of their talks, Willhelm Well (1797–1879) department chief in the Ministry of the Interior and Ignaz Natherny (1789–1867), his counterpart in the Ministry of Public Education, were sent to Pest in November of the same year. They discussed the matter with the senior officials of the medical faculty, inspected various sites and in due course returned home [61]. Nothing more happened in the matter, proving the *Medical Weekly*'s justified pessimism, which a year before had predicted that nothing would happen anyhow about the university clinical centre: "The building seems to be doomed", writes the *Medical Weekly*," by the fateful magic of dark powers, which no might has so far succeeded, either from below or from above, to overcome" [62].

Semmelweis worked on another committee, under Ignác Havas, appointed by the Conference of Hungarian Doctors and Nature-Observers to study plans for the reform of public hygiene.

In 1861 Semmelweis was a member of the university rector-electing committee (with Balassa, Rupp and Schuler), of the St. Stephen Society, of a committee for the establishment of the Hungarian Medical Publishing Company, and of a select committee under Prof. Balassa, which with the chair of pathology becoming vacant in 1860, was to suggest how to divide pathology from pharmacology.

It is impossible to discuss the details of all his numerous activities, which continued unceasing on an ever increasing scale until his death. From March 1862 on he was responsible for the Central Smallpox Vaccination Institute. It had formerly been a private concern, established by Xavér Ferenc Gebhardt (1790–1869) who lectured on medicine to surgical students. In 1824 it was placed under the auspices of the university's medical faculty under the management of Gebhardt as the Central Vaccination Institute, and it supplied doctors from all over the country with free vaccine. When Semmelweis was put in charge of the Institute he also delivered a weekly series of lectures entitled: "Theoretical

and practical smallpox vaccination". He was seriously devoted to this task, and saw that every doctor got the vaccine he required, and he himself dealt with the patients who came for vaccination to the medical faculty building in Hatvani Street [63]. Semmelweis went on in this function until 1864, when his assistant there, Gergely Patrubány, *Privat-docent* took over [64].

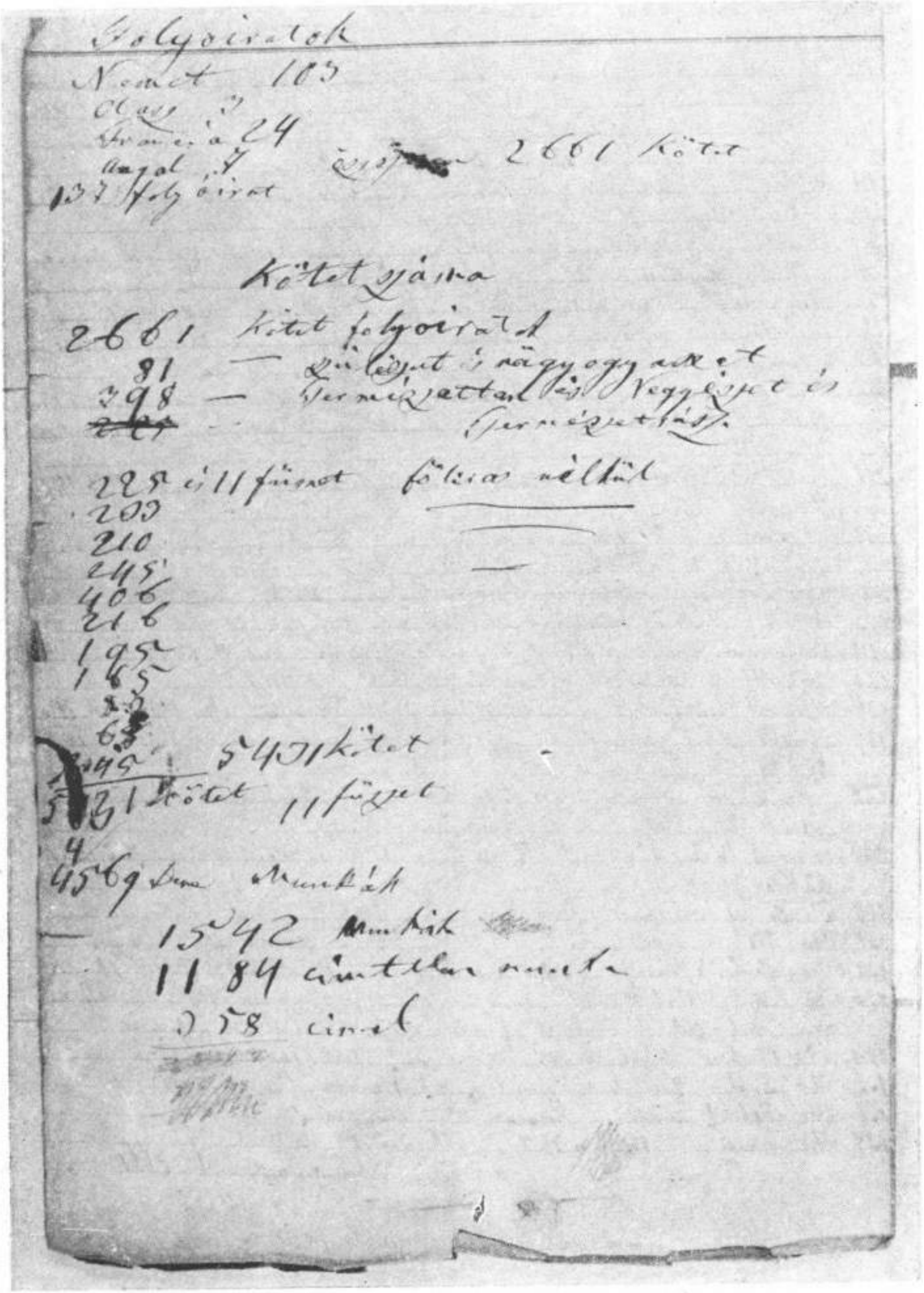
Between 1861 and 1864 Semmelweis was responsible for the library of the medical faculty and it was during his term of office that it was removed from unsuitable hired rooms to the main building of the faculty [65]. It was again thanks to his efforts that the first printed catalogue of the library comprising all the books until 1863 [66] appeared in two volumes: an alphabetical index catalogue, and a subject catalogue. The title-page does not indicate the name of Semmelweis, but the periodical *Medical Practice*, in its book review, states that the catalogue "was due to the untiring efforts of Semmelweis" [67].

Until 1877 the medical faculty of Pest University acted as the highest forum of forensic medicine. As its activities extended to all cases of medical jurisprudence in Hungary it was of course a great strain on the faculty. From the minutes of the dean's office it becomes evident that at least one forensic case was discussed at each faculty meeting, reported on by a special committee, the members of which were the professors of public hygiene, pathology, chemistry and obstetrics. As professor of obstetrics, Semmelweis naturally had to sit on this committee, too.

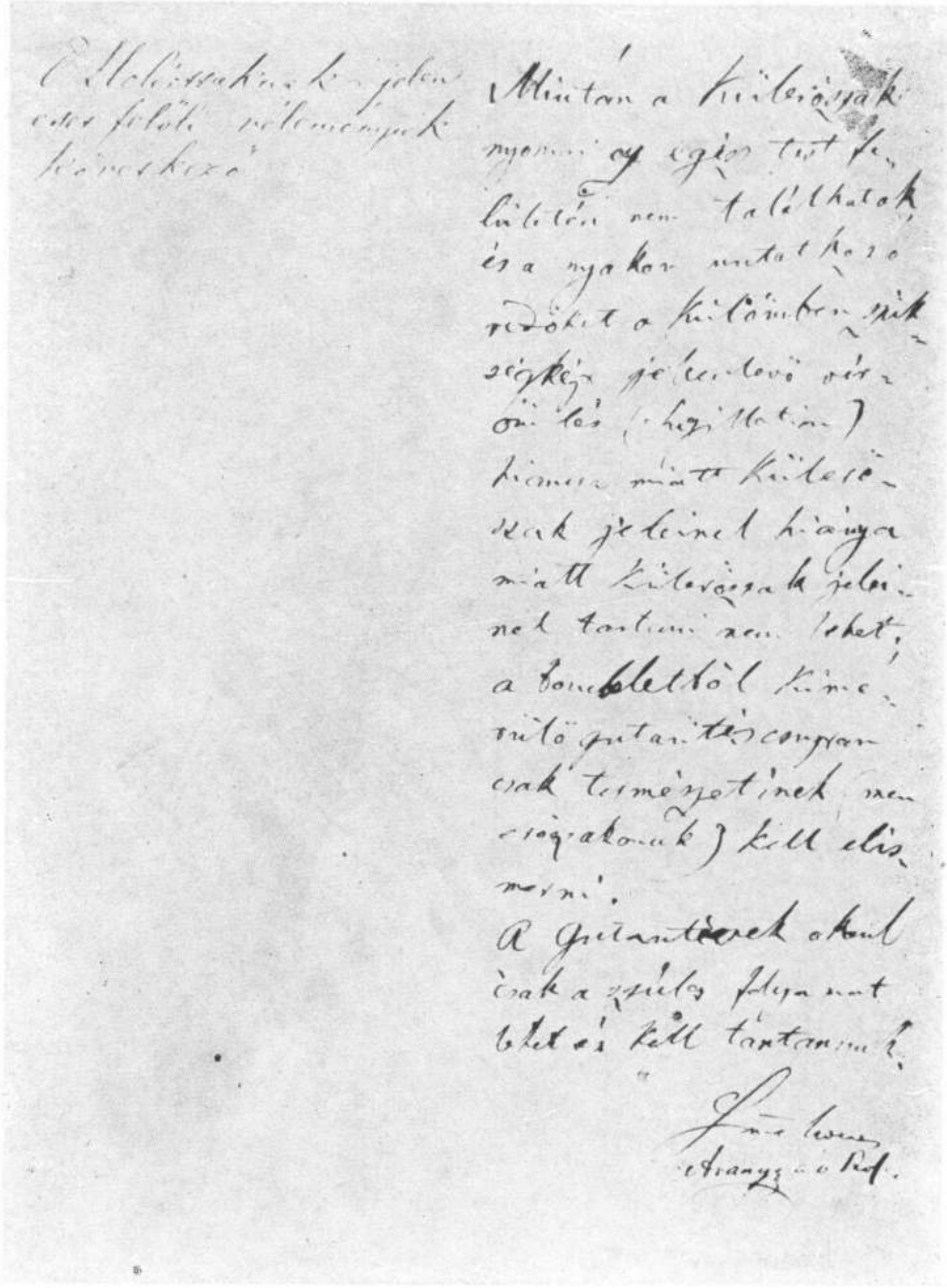
His many-sided activities on the other hand were often cramped by the antagonistic atmosphere existing in the medical faculty. Right until his death in 1854, Lajos Tognio (1798–1854), Professor of General Pathology and Pharmacology, was dean of the faculty. He never sympathized with the Hungarians, although his appointment in 1824 coincided with the age of national revival. In 1848, the revolutionary government was forced to dismiss him because of his anti-Hungarian activities. Tognio could not bear the idea of introducing reforms in the university and he positively hated Prof. János Balassa. He was at the head of the group of conservative professors who violently opposed the progressive-minded professors gathered around Balassa. After the death of Tognio, the two groups continued to disagree.

Kálmán Müller says: "Some of the former neutral elements approved Balassa who, however, was in a precarious position in the faculty; especially after 1860, when Hungarian became the language of public instruction and the German professors had to resign. In this new configuration of forces, Balassa could only reckon on an occasional majority: the faculty itself was strictly divided into two opposite camps who mixed in the faculty just about like oil and water. Faculty meetings consequently were quite stormy . . . Balassa and his circle who endeavoured to introduce new research methods prevalent in the west, were branded as cosmopolitans because of their repeated visits to western countries and their western contacts" [68].

In the same passage Semmelweis is described by Müller as of having an impetuous nature which increased the overheated atmosphere of the faculty.



Semmelweis's notes in the diary of the library of the medical faculty



A forensic medical report by Semmelweis and Arányi

Semmelweis's "impetuousness" was deeply rooted in his character, and in his love of truth, justice and honesty. In his article entitled "About Semmelweis — a Famous Contemporary" [69] Rezső Temesváry comments on it as follows: "Semmelweis could show extreme kindness to those whom he believed to be honest, but he was revolted by dishonesty; he never forgave any form of disloyalty. By nature he cultivated human contacts which were not always to his advantage. Many members in the faculty, not sufficiently perspicacious, the higher officials and other superiors, disliked him and were afraid of him."

Semmelweis was faced with special difficulties when accepting the post of economic superintendent of the medical faculty in 1854 (*Der Oekonomische Präfekt der Universitätsklinik*).

He first figures in this capacity in the minutes of the laundry tenders on April 6th, 1857, where he signs himself as *Oekonomischer Präfekt*. As such, Semmelweis must have been responsible for practically everything: Employing the staff, supervising their work, seeing to their pay, supplying the clinics with sheets and linen, drawing up the budget, etc. Functions of this kind are always invidious, but particularly under the political and material conditions of the faculty of medicine of those days. To prove how onerous his duties were let us quote a memorandum written in his own hand, as economic superintendent, to the university council, in which he says that the clinic staff had not received their salaries for months, and that he, as director of the clinic, had to advance them money out of his own pocket so that they should not starve [70].

In these circumstances, we cannot be surprised that Semmelweis got into so much trouble for overspending the budget, buying articles without preliminary authorization, organizing the laundry, getting new bed-clothes to replace the old rags, etc. There were constant difficulties about the laundry. Adolf Hécsey, who was commissioned to the clinical laundry, handed in a written complaint against Semmelweis in September 1864, addressed to the Presidential Council, accusing Semmelweis and the head-midwife Erzsébet Ruprecht in person in preventing him from the proper execution of his duties [71]. In his report, dated September 28th, 1864, Semmelweis confirmed that the laundry had returned the washing in a filthy state, soiled with blood, and would most likely cause the outbreak of a new epidemic of puerperal fever as happened during the Tandler management. He did not refer to supposed injuries caused to the proprietor. The Presidential Council confidentially advised the university council to warn Semmelweis that his behaviour was not correct [72]. This warning, however, did not solve the matter, and Semmelweis was obliged to appeal again to the Presidential Council advising them about the consequences of the insufficient laundering of sheets and bed-clothes.

The exacting and intricate economic function had caused him many difficulties, and naturally turned him occasionally against certain members of the medical faculty, and most especially against the Economic Department of the Presidential Council. It is evident that Semmelweis had done his best to decline this unpleasant function. He begged to be relieved of it, referring first to economic difficulties,

Semmelweis's letter to the Presidential Council proposing the general introduction of his prophylactic measures

Ebből meggyőződhetnek benn- és kinn-meggyőződhetnek
hazafiai közte kivégzésünk ismeretes eredményéről az egész
világ, hogy több kormányaink tudomására hozni, mire csak
alkalmas, hogy az általános óvszer, mellyet ellenségeink
ostromlói is általánosnak tartanak,
kinek közöl hogy ha nem is hozzánk, mint
az általános összegyűjtött tapasztalatiaknak
tok feltehetőn megszáradnak, semmi esetre sem
árt, — orvosságszerte bykivánt a korhűjaknál
általánosítottsék.

Buda Márt. 31 1862

A magy. kir. helytartó tanácsnak

alázatos szolgája

egy tan. tanár.

and secondly to his many other duties. When enumerating his activities he speaks for the first time about his scientific work, mentioning a book the proofs of which he was correcting at that time [73].

Nevertheless he was not relieved of his economic duties and he went on performing them until his death.

The trouble arising from his economic work did not stop with his death, but even affected his widow. In a writ issued on August 14th, 1865 (No. 60 267), Mrs. Ignác Semmelweis was made liable for the payment of 350 forints, a debt incurred by her late husband, because of the bad quality of linen bought by him for the university clinics in 1863–64. Mrs. Semmelweis appealed to the Presidential Council, submitting her case at great length (typical of those days), and begged to be dispensed from refunding the said 350 forints. She pleaded that her husband had "left nothing behind him". In its meeting held January 16th, 1866 the medical faculty declared that the linen was still being used in the obstetric and surgical clinics. This statement prompted the rector of the university to advise the Presidential Council to relieve Mrs. Semmelweis of her obligation.

On another occasion Mrs. Semmelweis was made responsible to account for a 2 900 forint sum her husband receipted on budgetary charges. When the final accounts were approved by the Presidential Council on September 8th, 1866 it was stated that the clinic owed Semmelweis 55 forints and 62 krajcárs.

When Mrs. Semmelweis had declared that her husband had died without leaving any money to his family she was supporting her plea, but it was also perfectly true. Semmelweis who "considered his obligations to mankind as coming before himself and his family" at his sudden death left his widow and his three children in utter poverty.

Soon after his death on September 25th, 1865, his wife addressed a petition to the university council asking for a widow's pension with special education fees for their children. The council discussed the request at its meeting of September 29th, 1865, and the rector, György Schopper passed it on with his warmest recommendation to the Presidential Council. Among other things, he wrote the following:

"As Professor of Obstetrics Semmelweis was a most inspired teacher of his subject, and was no less an expert in clinical work. As an obstetric practitioner he won fame for himself in two cities. As a benefactor of mankind he won recognition for himself and respect for the university he worked in. Beside shorter articles he made himself known by a work entitled *Aetiologie des Kindbettfiebers.* He was also recognized by the University of Zürich which invited him to the chair of obstetrics. However, he declined the offer, wishing to devote all his energy to the benefit of his own university."

The Presidential Council could and would not decide in the matter of the pension and the educational expenses. So on December 4th, 1865 Mrs. Semmelweis appealed to the King, imploring him to grant her request. Having proved her own lack of means as well as the fact that her late husband had died poor, a pension of 420 forints was granted, with an additional 50 forints each for the education of her three children, Margit, Béla and Antónia [74].

The University's attitude in the question of the pension was typical. With the exception of personal animosity from a few colleagues, in Semmelweis's lifetime fairness in the recognition of his scientific results and of the significance of his discovery was always evident.

On March 31st, 1862, Semmelweis had sent his book to the highest educational forum in Hungary, the Presidential Council, begging them to make the prophylactic measures compulsory in all Hungarian hospitals. ". . . It is both my duty as a man and a patriot", says Semmelweis in his appeal, "to place my conviction before the highest government office, and demand that the preventive measure (which has been called harmless even by my detractors and can certainly do no damage, whereas my observations prove it to be of the utmost usefulness), should be introduced in all the hospitals and made compulsory".

The Presidential Council sought the advice of the medical faculty, which discussed the matter on May 7th, 1862. The dean, János Nepcmuk Rupp, recommended and the faculty approved of the introduction of the Semmelweis prophylaxis in all hospitals and obstetric practice: " . . . The book of Semmelweis on puerperal fever is well known to the professors of this faculty. It is not less known that Prof. Semmelweis has definitely proved that certain infectious materials are responsible for the causation of puerperal fever, and on the basis of logical evidence he has pointed out what prophylactic measures should be applied for prevention. The faculty has much pleasure in presenting its approval in what follows: The measures suggested by Prof. Semmelweis must be observed in all hospitals, as well as in private practice, and the senior doctors are responsible for their observance by the midwives."

The medical faculty had unanimously and publicly approved the teachings of Semmelweis, and the university council in its session on June 5th, 1862 had passed a decision accordingly.

After the unanimous approval of the university, the Presidential Council addressed a circular to all district authorities on September 1st, 1862, asking them to give careful consideration to the contents of Semmelweis's book [75].

To All Whom It May Concern,

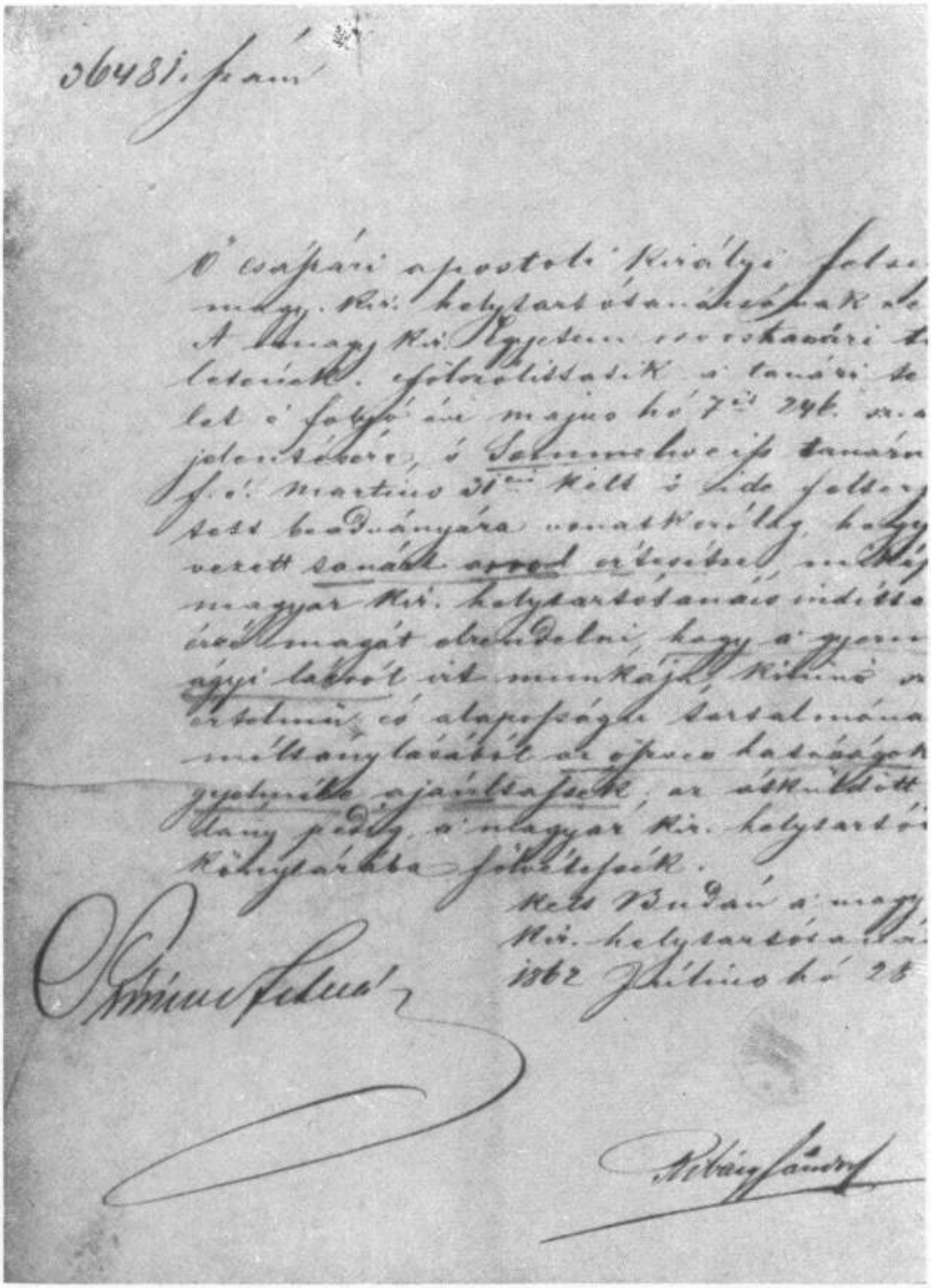
Dr. Ignác Fülöp Semmelweis, Royal Hungarian University Professor, in his excellent book on puerperal fever believes that it is caused by decomposed, organic animal material introduced into the body of parturient women.

Dr. Semmelweis's opinion is embraced by the medical faculty of the Royal Hungarian University and is shared by the best scientists and physicians.

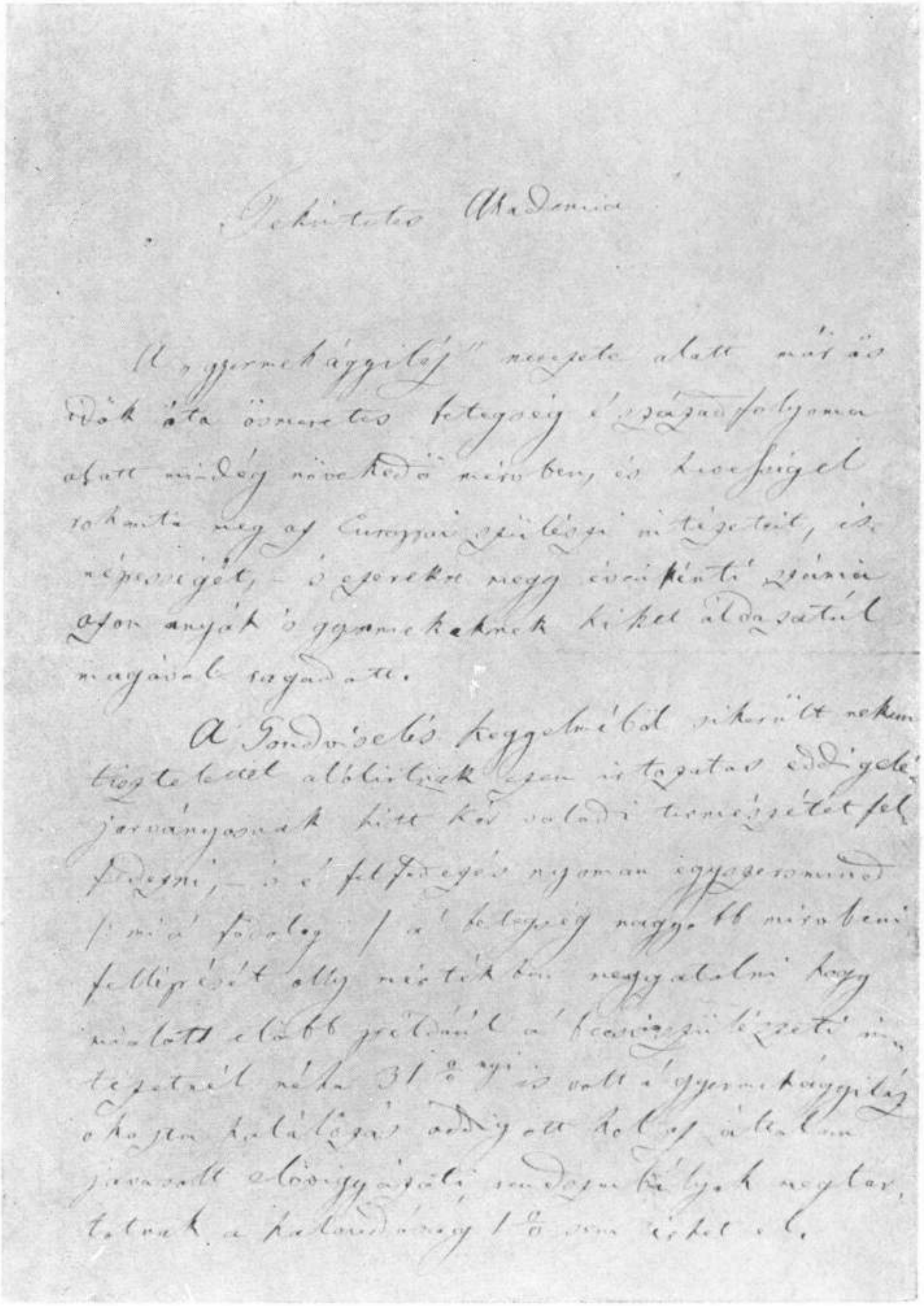
There can be no other reasonable prophylactic method than to prevent the introduction of any infectious, decomposed material into the body of the lying-in patient. For this reason the author proposes that physicians and midwives, before touching any infectious agent, should oil their hands profusely, in order to prevent the material from penetrating into the pores of the skin. Subsequently, by washing their hands well with soap and chlorine (chloratum calcis) to neutralize any remaining infectious substance, they should go on doing this until they find their hands smooth and slippery.



Professors of the medical faculty of Pest University in 1863. Standing: János Diescher, János Wágner, Lajos Arányi, Ignác Semmelweis, Gáspár Lippay, József Lenhossék, Jenő Jendrassik, Döme Nedelkó, Ferenc Linzbauer, Dávid Wachtel, Tamás Stockinger. Sitting: Vilmos Zlamál, Ignác Sauer, N. János Rupp, János Balassa (Drawing by J. Marastoni in the conference room of Budapest Medical University)



Presidential Council to the university council: calling their attention to Semmelweis's book



Semmelweis's letter to the Hungarian Academy of Sciences

Sorsom egy kegla magánál, hogy emlékét
feltegyét f. 1847 ik évben f tettem, mint a bécsi
Akadémiának tagjának orvosa hogy határain
kívül tartozkodjam. – Így történt hogy feltéte-
lével egyetértő is a' német Zukkéjön végnek lön
bemutatva.

Hazámba visszatérésem után a' magyar Kir.
értő közönségnek is előadtam tapasztalatimat,
s dolgoztam a' gyermekággyi láz körül egy itt meg-
jelenő „Provisi Utasításom".

Miután azonban tanom valósulnak nem találtak
ellenjére, több rendbeli részint megtámadásoknak,
részint elferdítéseknek volt egy kitéve Német
országban.

Az, emberiség iránti kötelességem gyanán-
csolta most már elméletemet még egyszer ki-
fejteni, s az alatt felhozott vádaknak semmisé-
gét kimutatni, mit egy itt felmutatott, s
tekintve a' körülményeket, mellyek között kelletett
így kényszerítve lenni is nem kábán tekinthetek.

Pogány a' tekintetes Akademia könyv-
tára számára nem lévén mit ugyan tehetnem
tehetem jobbat.

Pest, 1850

Semmelweis, Dr.
egyetemi tanár

By this method the hands can be made perfectly clean. It should however be remembered that infection can be introduced not only by means of the examining fingers, but also through any objects infected by contact with decomposed animal material. Consequently these must also be disinfected before being brought into contact with the genital organs, or else should be discarded: such objects can be surgical instruments, bed-clothes, sponges, etc.

As the infectious substances can be carried over by air too, it is imperative that the wards should be well and frequently aired and that exhalations and exudations should be removed before decomposition.

These preventive measures which have been examined and found indispensable should be introduced and observed in hospitals, obstetric and lying-in wards and in private practice. Therefore we call upon all officials to advise physicians, surgeons, obstetricians and midwives to study the prophylactic measures proposed by Prof. Semmelweis in his book on puerperal fever and to introduce them in hospitals and elsewhere.

It is evident, therefore, that neither the scientific world nor the authorities in Hungary had remained indifferent to the teachings of Semmelweis. The highest health authority, the Presidential Council, with its above-quoted circular, had taken the first step in 1862 towards the compulsory introduction of the prophylaxis advised by Semmelweis [76].

We cannot say, on the other hand, that the teachings of Semmelweis were unopposed in Hungary [77]. Suffice it here to mention the case of his predecessor, Professor Birly, who had simply taken no notice of Semmelweis's discovery, although they had worked practically side by side when the latter was the head of the obstetric department in Rochus Hospital.

Semmelweis did not take all this too seriously. In a letter addressed to the Hungarian Academy of Sciences in 1860, he definitely states that there are few scientists in Hungary who reject his teachings outright.

On November 27th, 1860 Semmelweis decided to send his book to the Hungarian Academy of Sciences (see Chapter V). In the enclosed letter he says:

The Hungarian Academy of Sciences

Dear Sirs,

"Puerperal fever" as a disease has been known since ancient times, but in the last century it has increased so much that it has devastated the population, decimating the patients of the lying-in hospitals—thousands and thousands of mothers and their infants dying yearly as its prey.

The undersigned has had the honour through Providence to discover the real cause of the horrible disease believed previously to be epidemic—the discovery enabling him (the crux of the matter) to prevent the spreading of the same to an extent that whereas e.g. in the obstetric clinic in Vienna mortality in puerperal fever was 31 per cent, with the observance of my preventive measures mortality cannot reach even 1 per cent.

It has been my fate that at the time when I made my discovery (in 1847) I worked as assistant in the obstetric clinic of Vienna, outside the boundary of Hungary. That is the reason why my discovery was first submitted to German expert circles.

Returning to Hungary I soon described my observations and theory concerning puerperal fever to the Hungarian expert public in an article in the *Medical Weekly*.

My theory met with favourable reception in Hungary whereas in Germany it was partly distorted and partly attacked.

My duty to mankind forced me to give a new definition to my theory and prove the nullity of the charges against it, which has been done in the book here submitted, written in German, with regard to those I particularly wish to appeal to.

I have much pleasure in offering a copy of my work to the library of the Academy as a token of my respect.

Yours faithfully,
Ignác Semmelweis
University Professor

In a letter addressed to Tibor Győry, Prof. Imre Navratil, a former student of Semmelweis, confirms the fact that the discovery met with no opposition in Hungary [78]:

Budapest, June 5th, 1905

My dear Colleague,

As a former student of the late Professor Semmelweis, I have much pleasure in complying with your wish that I should provide You with information concerning him and place it at your disposal.

I knew Semmelweis from 1855. When I also attended his lectures as surgical student of Prof. Balassa in 1858 I had more opportunities of meeting him. Since I worked in the Pathological Institute on cadavers I was only admitted at the special recommendation of Balassa, and Semmelweis took my word of honour that I would never enter his clinic straight from dissection work. Balassa, too, insisted that he would withdraw his support if I did not comply with Semmelweis's wish and did not disinfect my hands most meticulously with chlorine solution before going to the obstetric ward: I complied to their wishes most conscientiously. When Semmelweis performed the first ovariotomy in Pest, Balassa acted as his assistant, and before the operation both submitted to the strictest precautionary measures. When later Balassa performed his ovariotomies he always observed antiseptic measures as suggested by Semmelweis.

This confirms that Balassa completely shared Semmelweis's views concerning antiseptic measures and observed them at all times.

As regards his lectures, although the professors of the Bach-era had lectured in three languages, Hungarian, German and Latin (the professors appointed during that period were all Austrians and lectured in German), Semmelweis lectured in Hungarian. He spoke it fluently, with sound elocution, if not in an ornate style.

I always accompanied him home after the lectures and he spoke at great length about his bitter experiences in Vienna, about the bad treatment he had received there (he spoke about Skoda and Hebra in most flattering terms), stressing how happy he was to settle down in his native town and to have been admitted into Rochus Hospital as a physician.

As a native of Buda, he proudly professed himself to be a Hungarian, and was one of the first in the early sixties demonstratively to wear the Hungarian national attire. He had his photograph taken in that attire, which I still cherish. The same picture figures in the ornate volume that we presented as a token of our respect to all members of the medical faculty. Though there would have been any number of chances in our conversations, not once did he say that he sould have liked to return to Vienna.

He only showed his dissatisfaction with the cramped rooms in his clinic. But all the other professors too shared his views, and were constantly begging the Government, with Balassa at their head, for new premises, insisting that the situation was unbearable. When at long last he and Balassa would leave their small rooms in Hatvani Street (later Kossuth Lajos Street) and move into the Kunewalder house (today polytechnic school), he was the happiest man on earth. Here he worked with dedicated love until his death in 1865.

What had been denied him by the specialists in Vienna, was given to him in Hungary, where he enjoyed the love and respect of his colleagues, recognition as scientist and teacher and admiration for his great discovery.

I remain

Your humble servant,
Dr. Imre Navratil
Court Councillor,
University Professor

Notes

1. For verbatim text of *Generale Normativum Sanitatis* cf. *Linzbauer Codex* vol. II, pp. 535–571.
2. Weszprémi's book is the exact translation of H. Nepomuk Johann Crantz (1722–1797), *Einleitung in eine wahre und gegründete Hebammenkunst*. (Wien, 1756).
3. Cf. Sámuel Domby (chief medical officer of county Borsod), *Bábamesterség* (*Midwifery*). (Pozsony, 1772); Károly Mócsy, *A bábamesterség elei* (*Early Midwifery*). (Pest, 1785); in his textbook there is a picture showing a lying-in chair, with footrest and hand-handle from the eighteenth century; János Zsoldos, *Asszonyorvos* (*Woman-doctor*). (Győr, 1802) a book written in a racy Hungarian style, to be used also by the midwife; József Sebestyén Peterka, *Bábamesterséget tárgyazó kathecismus, az az kérdésekben és feleletekben foglalt oktatás, mellyet az együgyübb és falusi bábaasszonyoknak nem különben minden renden levő asszonyságoknak és falusi bábáskodó seborvosoknak a' számára, közhaszonra kidolgozott és elkészitett P. J. S.* (*A Catechism of Midwifery, i.e. Instruction in Questions and Answers for the Benefit of the Simple Village Midwife, or Any Woman, the Village Surgeon Acting as Midwife, Written and Prepared by P.J.S.*) (Pest, 1814); András Lugosi Fodor, *Szülést segitő tudomány és mesterség* (*The Art and Craft of Midwifery*). vols I–II (Pest, 1817); Károly Tormay, *Bábászati kalauz* (*Guide for the Midwife*). (Szekszárd, 1846) in Hungarian and German; József Fleischer, *Alsóbb szülészet tankönyve bábák számára* (*Primer of Midwifery*). (Buda, 1869).
4. J. Plenck, *Anfangsgründe der Geburtshilfe*. (Wien, 1768). The book appeared also in Latin: *Elementa artis obstetriciae*. (Vienna, 1781).
5. Gy. Korbuly, *A szülészet bölcsőkora* (*Early Days of Midwifery*). (Budapest, 1938).
6. Under the title of "*Pediatria et gynaecologia*" lectures were held by József Bräuer, Professor Extraordinary from 1839 to 1850. Cf. *Ordo Praelectionum in Regia Scientiarum Universitate Pestiense pro anno scholastico 1850–51. Semestri Hiberno, Budae, Typis Cae, Reg. Typogr. Univers. Hungar.*
7. "*. . . dessen vortrefflicher praktischer Unterricht nicht genug zu rühmen ist; seine Methodus exspectativa und die Wahl des rechten Augenblickes machen ihn zum Meister in der Entbindungskunst*". Cf. Anton Jankovics, *Pest und Ofen*. (Buda, 1838).
8. L. Markusovszky, Irányelvek az ifjúságnak (Slogans for the Students). *Orvosi Hetilap* (*Medical Weekly, hereafter OH*), Oct. 22 (1865).
9. *Gyógyászat* (*Medicine*) (1868) p. 3.
10. A. Berzeviczy, *Az abszolutizmus kora 1849–1865 (The Age of Absolutism 1849–1865)*. 3 vols (Budapest, 1921–26); D. Angyal, A Magyar Tudományos Akadémia és az önkényuralom (The Hungarian Academy of Sciences and the Age of Oppression). *Budapesti Szemle* (*Budapest Review*) (1903) pp. 1–33.
11. At the request of the authorities, the Society gave its opinion concerning the public sale of lye, physician's tariffs, the report of the chief medical officer of Pest on "gout of the jaw-bone" occurring in the early eighteen-fifties in match factories and related problems of phosphorus necrosis, the forensic laws of dissection, etc.
12. *OH* (1882) p. 23.
13. National Archives (hereafter Nat. Arch.) Geringer papers, 3981/1849.
14. F. Korányi, Emlékbeszéd Markusovszky Lajos felett (Memorial Speech on L. Markusovszky), held in the Budapest Royal Medical Society's LXVth General Meeting on Oct. 14th, 1902. Cf. Supplement of *OH* No. 42 (1902).

15. János Balassa (1814–1868), Professor of Surgery in Pest University from 1843 to 1868. Modern surgery in Hungary is connected with his name. He was well known and respected even outside Hungary. He was twice offered the chair of surgery in Vienna. Frigyes Korányi addressing Balassa in a toast said: "The small circle gathered around János Balassa had a stimulating effect; it consisted of excellent men of similar ambitions, who loved science, honestly and deeply attached to each other." The memorial speech held on Balassa by Jenő Jendrassik contains a list of Balassa's published works and discusses his career. Cf. Minutes of the General Meeting of the Hungarian Academy of Sciences, May 28th, 1870 (Pest, 1870) p. 33.
16. Cf. Note 14.
17. Semmelweis, op. cit. p. 137. The hospital had no pathologist until 1861, and its dissection room did not work until 1870.
18. "... *der von Wien aus wohl bekannte Dr. Semmelweis soll als Dozent on der hiesigen Universität, neben Birly, praktische Geburtshilfe vortragen, zu welchem Berufe ihm im Rochus Spitale zwei Zimmer überlassen werden*".
19. Nat. Arch., Archives of Period of Absolutism. K. K. Statthalterei für Ungarn, General Papers (D 55), 1851/1201.
20. M. Haffner (d. 1806), *Versuch eines Vorschlages an den löblichen Magistrat und das Publikum der königlichen Freystadt Pesth zur Errichtung, Einrichtung und Unterhaltung eines zweckmässigen Krankenspitals.* (Pest, 1793).
21. A. Vályi: *Magyar Országnak Leírása* (*Description of Hungary*). 3 vols (Buda, 1796–1799). The new hospital is described as follows: "The new civic Hospital built in 1796–97 is so good, spacious and well-built that its like cannot be found in any city of the Imperial Monarchy; except perhaps the great Hospital in Vienna, but as to the size of the city and its population it is not bigger". vol. III, p. 71. The hospital, its life, equipment and organization are described by J. Schwarzl, *Nosocomium civium Pesthiensium ad St. Rókus.* (Pesth, 1843). Inaugural speech. The first director of the hospital was Mihály Haffner, followed for a short time by Ferenc Bene, then until 1825 András Bossányi (1754–1826), followed again by Leopold Windisch (1768–1842). Windisch published a booklet on the hospital: *Gründliche Darstellung der Einrichtung des bürgerlichen Krankenhauses in der königl. Freistadt Pesth.* (Pest, 1829). In his time "... the slightly deproved hospital was filled with the true spirit of humanism." Cf. *Orvosi Tár* (*Medical Review*) (1842) p. 20. Windisch was followed as director by János Piskovich (1806–1847) who died during the 1846–1847 typhus epidemic of the hospital. He was succeeded by Ferenc Flór (1808–1871) first as a deputy, but he was appointed director in 1848 by the city authorities. However he resigned in the same year to become "medical chief of Lajos Kossuth" and organize the medical service of the revolutionary army. Flór was simultaneously chief of civil hygiene in the Ministry of the Interior. In his absence, Károly Hoffman became director of the hospital, followed by Tamás Stockinger (after the occupation by the Austrians on January 5th, 1849), and Károly Hoffman again reinstated. During Semmelweis's office Ferenc Brunner (1815–1861) was director.
22. First medical department under József Brunner, 104 beds; second medical department under Károly Hoffman, 104 beds; third medical department under Rudolf Rezső Kriek, 94 beds; fourth medical department in almshouse, under József Rózsay, 55 beds; maternity department, under Ignác Semmelweis, 37 beds; dermatological department, under Imre Poór, university lecturer, 27 beds; first surgical department, under Endre Riffel, senior surgeon, 127 beds; second surgical department, under Endre S. Kovács, 128 beds.
23. In the early eighteen-sixties Imre Poór had been granted the exceptional right to hold lectures as *Privat-docent* in the Rochus Hospital on "dermatology and venereal diseases". Cf. *Gyógyászat* (*Medical Practice*) (1861) Nos 3–5.
24. In 1871 puerperal fever broke out as an "epidemic" in the Rochus Hospital. 9 out of 254 childbed patients (3·54 per cent) died of puerperal fever. Cf. *OH* (1872) p. 775.

25. *OH* (1918) pp. 359–360.
26. *Pester Lloyd*, June 13th (1857).
27. Nat. Arch., 12 228/1856. "*An den Stadt Magistrat Pest. Laut Erlasses des hohen kaiserlich-königlichen Ministeriums für Cultur und Unterricht vom 29. April 1856. Zahl 5503. ist dem anhergestellten Gesuche des Doctors und Professors Ignatz Semmelweis um weitere Belassung als Primar Arzt an der Gebär Abtheilung des Bürgerspitals zum heiligen Rochus in Pest, ungeachtet sich das hohe Ministerium nicht verhehlen konnte, dass es im Interesse der Wissenschaft wünschenswerth sey, dass der Professor der Geburtshilfe ein reicheres Materiale zu Gebothe stehe, da ihr die Clinik für sich allein zu biethen vermag, deshalb keine Folge gegeben worden, weil die Versehung des zweifachen Dienstes zu grossen Schwierigkeiten obliegt, weil das Rochus Spital zu entfernt von der Universitäts Clinik ist, und weil Gebähren der besserer Sitten wider ihren Willen nicht Lehr Objekte sein können.*

    Der Magistrat wird hiervon mit Bezug auf den Bericht von 29. Jänner 1856. Zahl 948. mit dem Bemerken in Kenntniss gesetzt, dass die Verständigung des Professors Semmelweis unter Einem im Wege des academischen Senats der Pester Universität veranlasst worden sey, und nunmehr gegen die Durchführung des am 27. Dezember 1855. erfassten Rathsbeschlusses des städtischen Magistrats, womit Doctor Ignatz Rott zufolge des hierortigen Erlasses vom 7. August 1855. Zahl 17 723. um unbesoldeten Primar Arzt an der Gebär Abtheilung des Bürgerspitals zum heiligen Rochus in Pest ernannt wurde, kein weiterer Anstand obwalte. Wovon Doctor Ignatz Rott unter Rückstellung seines anliegend beifolgenden Gesuches zu verständigen ist. Ofen am 23. May 1856. August."
28. The legend in the plaque placed in the wall of the Rochus Hospital in 1934 is not correct. Semmelweis had worked in the hospital from 1851 to 1857, and not as the legend says till 1855. In the speech delivered by Károly Schmiedlechner (1870–1940), head of the obstetric department of the Rochus Hospital, at the celebration other false particulars were included: Semmelweis's birthday was not July 17th, the day of his death was not August 13th, 1868, and his appointment as university professor was not in 1853. Cf. D. Raisz, *A közkórházi orvostársulat első 50 éve* (*The First Fifty Years in the Life of the Municipal Medical Society*). (Budapest, 1943) p. 96. Thus it is not surprising that we find wrong particulars in foreign references to Semmelweis. Pinard, e.g. quotes 1858 as the year of Semmelweis's appointment as professor. Cf. *Presse Medicale* (1906) pp. 739–742. Arturo Castiglioni (1874–1953), medical historian who studied in Vienna and had worked for a lifetime at Trieste, in his famous medical history, translated into five languages, stated that Semmelweis was appointed to the chair of obstetrics in the University of Pest in 1845, and his statue was erected in Pest in 1894. Cf. *A History of Medicine*. Translated and ed. by E. B. Krumbhaar, 2nd ed. (New York, 1947) p. 1192.
29. *The Jubilee Year-Book of the Budapest Royal Medical Society, 1837–1937*. Ed. by P. Salacz (Budapest, 1937) p. 315. It contains valuable particulars concerning Semmelweis. It refers to Semmelweis's lecture in 1857 (p. 149) discussed at length by the *Wiener Med. Wschr.*, January 10th, 1858; the lecture sequence held in 1858, on January 2nd, 23rd, and on May 16th; the photostat copy of the German minutes made at the January 2nd session is reproduced, with the report made by the *Medical Weekly*; the text of the speech made by Sándor Lumniczer, first secretary of the society, to commemorate the death of Semmelweis on Oct. 14th, 1865 (p. 165). From here we learn that during the VIIIth International Conference of Public Health and Demography in 1894 a Semmelweis memorial session was held (p. 228). We also hear about the Semmelweis celebrations of 1906, the speeches made by Árpád Bókay and Tibor Győry on September 29th, 1906 (pp. 250–251). Salacz also informs us that in 1911 the lecture hall of the Medical Society was named after Semmelweis (p. 264) and in 1923 his portrait in oil was placed on the front-wall (p. 278). Cf. Gy. Korbuly: Semmelweis és a Budapesti Királyi Orvosegyesület (Semmelweis and the Budapest Royal Medical Society). *Budapesti Orvosi Ujság* (*Budapest Medical News*) (1938) pp. 277–279.
30. E. Gombocz, *A Királyi Magyar Természettudományi Társulat története 1841–1941*. (*The*

History of the Royal Hungarian Society for Natural Sciences 1841—1941). (Budapest 1941.)

31. J. Bruck, *Semmelweis Ignác Fülöp* (Budapest, 1885) p. 53.
32. E. C. J. von Siebold, *Sechster Bericht über die in der königl. Entbindungsanstalt zu Göttingen vorgefallenen Ereignisse in dem Jahren 1845. und 1846.* There is no better proof to refute the allegation of certain historians that Semmelweis was either German or Austrian than this book. If somebody scribbles marginal notes in a book it can only be in his mother-tongue. If we add that the text was in German and the notes in Hungarian, it becomes obvious that Semmelweis not only professed to be Hungarian, but thought and wrote in Hungarian, if not forced by some reason or another to speak German.
33. The financial situation of the physicians in the eighteen-fifties and sixties was less favourable than before. Private practice in obstetrics and children's diseases was mainly in the hands of the midwife. — The physicians in Pest numbered in 1840, 100, in 1860, 160; in 1861, 166—not counting the surgeons who formed a separate category. In other words, there were far too many physicians in Pest and their earnings were low. In 1851 the *Wiener Medizinische Wochenschrift* stated that Hungary was "saturated" with doctors to the extent that the situation had created a "medical proletariat" (p. 635). Owing to saturation in the doctor's profession, many physicians had looked for a livelihood elsewhere. Ferenc Entz (1805–1877) after spending 16 years as general practitioner at Mezőkomárom, started in 1850 in the company of three other physicians, Lajos Arányi, Imre Friewaldski and Ignác Málnai a "vineyard and garden nursery" in Buda, they expanded into market-gardening, and in 1853 established a training school for gardeners. The National College for Gardening developed from their school. Entz became the pioneer of scientific gardening. He also edited two journals: *Kertészeti Füzetek* (*Gardening Papers*) and *Borászati Lapok* (*Viticulture*). Cf. *Az Országos Magyar Kertészeti Egyesület Aranykönyve 50 éves fennállásának alkalmából.* (*The Golden Book of the Hungarian Gardening Association Published on its Fiftieth Anniversary*). Ed. by S. Mágocsy-Dietz and J. Kovács, (1935). József Bach, assistant physician at the Rochus Hospital, had become a chemistry-master at the Agricultural College at Keszthely in 1857. József Török (1813–1894) who during the revolutionary government of 1848 had been a ministerial councillor under Pál Bugát, chief medical officer, became after the armistice of Világos a master of chemistry, natural history and mineralogy in the College of Debrecen, and later professor of public health and forensic medicine at the Legal Academy of the same town. Zsigmond Pete (1826–?) consulting physician at the Császár Medicinal Baths became in 1863 *Privatdocent* in balneary science and in 1865, a simple master in the secondary school at Székesfehérvár. Lajos Paulikovics (1832–?) practitioner at Sarkad and borough medical officer of Szalonta (1861) became in 1865 schoolmaster in Kassa. György Böckh (1822–1874) also became a schoolmaster winning for himself universal fame with his collection of many different species of spiders. Kornél Chyzer (1835–1909), the later reformer of public health, who obtained his medical degree in 1858, became assistant schoolmaster in natural history in a secondary school of Pest and assistant attendant in the zoological collection of the National Museum. He was admitted as corresponding member of the Hungarian Academy of Sciences in 1861, when he was 25 years of age, with a treatise written on the leaf-legged crab in Pest–Buda. The secretary of the Society for Natural Sciences, Sándor Tóth (1828–1863), was a physician and taught natural history in a secondary school in Pest; so was Gyula Kováts (1815–1873), attendant in the natural history section of the Hungarian National Museum, was to become assistant professor of mineralogy and zoology, and professor of natural history in the University of Pest, Ágoston Ötvös (1810–1861) historian, member of the Hungarian Academy of Sciences, Vilmos Zlamál jun., natural history master in the lyceum of Pozsony. János Pados (1819–1892), who became later R. C. rector in Nemestördemic and was famous as a writer, also had a medical degree.
34. Cf. *Biographisches Lexikon.* Ed. by Konstantin Wurzbach (1877) vol. 34, pp. 88–89.
35. Cf. E. C. J. Siebold, *Geburtshilfliche Briefe.* (Braunschweig, 1862) p. 89.

36. Cf. Schürer von Waldheim, op. cit. p. 96.; Sinclair, op. cit. p. 124.
37. "*. . . es ist wohl keine Indiskretion wenn ich anführe, dass sowohl ärztliche Stimmen, als auch die öffentliche Meinung unserer ausgezeichneten, in Theorie, wie Praxis gleich tüchtigen Geburtshelfer . . .*" Cf. *Wien. Med. Wschr.* (1855) pp. 109–110.
38. T. Győry, *Az orvostudományi kar története 1770–1935* (*The History of the Medical Faculty 1770–1935*) (Budapest, 1936) p. 520.
39. The full text of the decree in Hungarian is quoted by J. Kollarits, *Az orvosi karra vonatkozó érvényes fontosabb törvények, rendeletek, szabályok és határozatok* (*Important Acts, Decrees, Rules and Decisions in Force in the Medical Faculty*). (Budapest, 1910).
40. *Wiener Medizinische Wochenschrift* (1851) p. 223; ibid. (1853) p. 757; ibid. (1857) p. 343. The periodical discloses also that the Obstetric Clinic in Vienna, never renowned abroad for its achievements but only for the number of its patients, at the suggestion of Karl Braun had been newly equipped with lecture rooms, dissection theatre, etc. Cf. *Wiener Med. Wschr.* (1857) pp. 411–467, 514.
41. An English translation of the Hungarian text of two of Semmelweis's addresses to the Presidential Council runs as follows: "The removal of the furnishing of the Imperial Royal Obstetric Clinic to the Kunewalder house cost 45 forints as seen in bill enclosed. Equipping the clinic with a new floor cost 30 forints. Total 75 Austrian forints. As the said sum did not figure in the budget, may I beg the Council to make provision for the payment of 75 forints. Pest, November 9th, 1859. Signed: Semmelweis, Imperial and Royal Professor." And "The Medical Faculty. Sirs, The Imperial and Royal Presidential Council in Buda has decreed as under Order No. 33 460, November 29th of the current year, that a confirmation should be given of the making of the new floor in the rooms of the Obstetric Clinic before the cost of 30 Austrian forints can be paid out; the Undersigned states that, as new doors were opened and the old ones walled in and new plastering made, the woodwork covering the floors had to be removed for the inspection of the foundation, etc. It seems natural that the floor, having been put back, had to be cleaned and polished, as is fit with hard-wood flooring. Semmelweis, Professor of Obstetrics" (see facsimile on p. 96).
42. In 1879 the clinic was removed to where the 1st Obstetric Clinic stands today, corner of Baross Street and Mária Street.
43. Report on the work done in the Obstetric Clinic of the Royal Hungarian University of Sciences, 1869–1870. (Pest, 1871).
44. Nat. Arch. 1885–399–1857 VI. Akademischer Senat der Universität zu Pest wegen der Wäschereinigung in den medizinischen Kliniken.
45. Elizabeth (1831–1903), daughter of Archduke Joseph and his third wife, Maria Dorothea, princess of Würtenburg, was married (1847–1849) to Prince Ferdinand of Modena (1821–1849). After his death, Elizabeth married in 1854 Prince Charles Ferdinand (1818–1874). the son of Archduke Charles Victor of Aspern. Cf. Nat. Arch., Ofner Satth. Abdt. 12 168/1856 Praes; 2887/1857; 1658/1856.
46. "*. . . Wir glaubten diese Chlorwaschungstheorie habe sich längst überlebt . . . es wäre an der Zeit sich von dieser Theorie nicht weiter irreführen zu lassen.*" *Wiener Med. Wschr.* (1856) pp. 534–536.
47. "*. . . aber die Lehrkanzel, das entsprechende Wirkungsfeld, hat Wien dem Entdecker, dem Meister, dem Wohltäter der Menschheit vorenthalten! . . . so musste fortan Wien Pest den Ruhm überlassen, Sitz der Lehr- und Forschertätigkeit Semmelweis', der Ausgangspunkt seiner manifestartigen Publikationen gewesen zu sein.*" *Wiener Med. Wschr.* (1918) pp. 1173–1178.
48. "Szemmelweisz, Ignatius and Widenhoffer, Mária to be married. Witnesses: D. Waldhier Antonius civis elect. Pestilens. et domus proprietor et Hartleben Conradus Adolphus bibliopola Pestiensis. Copulans: Adm. R. Dom. Szemerényi Carolus A. Dioec. Strigon Presbyter." Ignác Weidenhoffer (Widenhoffer, Waidenhoffer), Semmelweis's father-in-law,

ribbon-merchant, was made a citizen of Pest on February 28th, 1825. Antal Waldhier, one of the witnesses was a glazier, elected citizen after May 16th, 1843. In 1847 he became custodian of the City Parish Church in Pest, in 1848 guardian of the Boys' Orphanage, city councillor of Pest in 1861 and 1867.

49. Cf. *OH* (1858) p. 42.
50. "*Erziehungsdirektor Dubs bot ohne Befragung der Fakultät den Lehrstuhl dem von Rokitansky empfohlenen Karl Braun in Trient an, der jedoch ablehnte. In dieser Zeit ging u. A. und zwar durch Moleschott vermittelt, eine Anfrage I. Ph. Semmelweis nach Prag: Wohl der einzige Ruf, den dieser viel umstrittene Reformator der Geburtshilfe erhielt. Auch er schlug aus.*" *Die Universität Zürich 1833 und ihre Vorläufer. Festschrift zur Jahrhundertfeier.* (Zürich, 1938). A short news in the *Wiener Med. Wschr.* announced that Dr. Karl Braun (Trient) had been invited to the chair of midwifery, obstetrics and paediatry in the University of Zürich, but in spite of the favourable conditions, it was declined by him. Within a short time—on December 5th, 1856– Braun was appointed Professor of Obstetrics in the 1st clinic in Vienna.
51. "*Eine ehrende Berufung nach Zürich lehnte er ab, da er sich in seiner Vaterstadt heimisch fühlte.*" *Grosse Aerzte.* 3rd ed. (München, 1954) p. 325.
52. T. Győry, *A budapesti orvosi kar története* (*History of the Medical Faculty*). (Budapest, 1936) p. 527.
53. W. L. Brunn, Wurde Ignaz Philip Semmelweis im Jahr 1857. an die Universität Zürich berufen? *Vierteljahrschrift der Naturforschenden Gesellschaft in Zürich* (1951) pp. 73–76.
54. Semmelweis, op. cit. pp. 147–149.
55. P. Bugát, *Bábaság* (*Midwifery*). (1814) MS in the Library of the Budapest Medical University, M. B. 42.
56. L. Csirke, *A szülészeti műtétemények* (*Operationes obstetriciae*). (Buda, 1837).
57. Syllabus of the Royal Hungarian University of Sciences, 1861, 2nd summer term. (Buda, 1862).
58. *Wiener Med. Wschr.* (1858) pp. 25–26.
59. *OH* (1861) 15. pp. 286–287; ibid. (1864) pp. 12–13; *Gynaecologia*, Suppl. Nos 2, 3, 5, 6, 7, 8, 9, 10, 11, 12 (1864); ibid. Suppl. Nos 2, 4, 5, 6 (1865).
60. *OH* (1862) pp. 719–720; ibid (1862) p. 984. The woodcuts of Russ could not be traced. So far they have not been recovered.
61. *OH* (1859) Nov. 22nd.
62. *OH* (1858) p. 272.
63. *Gyógyászat* (*Medical Practice*) (1862) p. 248.
64. Gergely Patrubányi, *Privat-docent*, later chief medical officer of Pest (1873–1889).
65. *Gyógyászat* (*Medical Practice*) (1861) pp. 279–280.
66. Catalogue of the library of the Medical Faculty, Royal Hungarian University of Sciences, Pest, 1863, until end of December, vols I–II (Pest, 1864); Gy. Korbuly, A budapesti orvoskari tanártestület. Weszprémi István könyvtára (The Professors of the Medical Faculty of Budapest. István Weszprémi's library). *OH* (1943) p. 147.
67. *Gyógyászat (Medical Practice)* (1864) p. 400.
68. K. Müller, *Az orvostudomány magyar mesterei* (*Hungarian Masters of Medical Science*). (Budapest, 1924). Introduction.
69. R. Temesváry, Semmelweisről — egy híres kortársa (A Famous Contemporary about Semmelweis). *Pesti Napló* (*Diary of Pest*) (1927) February 6th.
70. Excerpt from Semmelweis's memorandum: "To the Academy Senate (University Council). Owing to the fact that in the previous year the assistants had not received any payments for seven months, nor had the servants for several months, the undersigned has not considered it advisable to decline payment to the nurses before their leave when the newly admitted get their salaries. It seems likely that before their leave no money will be forthcoming, and the nurses will face starvation, because the undersigned will not be able to

go to their assistance as he had been obliged to last year . . .” Signed “Semmelweis, Imperial and Royal Professor, Economic Superintendent.”

71. Nat. Arch., 74 789/1864.
72. Nat. Arch., 83 123/1864.
73. Excerpt from the memorandum: “To the Academy Senate (University Council). The undersigned wishes to announce that he has resigned his post as economic superintendent. When I the undersigned accepted the post of economic superintendent I did so in the belief that it would enable me to help the clinics in their deplorable backward state which had caused great concern to this Imperial and Royal Highness. Soon however I came to realize that it was not so. I would have resigned long ago from a position conflicting with my aims, had I not been repeatedly assured that an independent economic officer would soon take over . . . This office should not be held by a university professor who should employ his time better, therefore, I resign. This month for instance, I had to examine 87 midwife pupils on two occasions. I examined the university students at the end of the term, who sat at the finals, — not to mention the fact that I also have private practice, my book which is in the press has not been completed and I have to hurry so as not to delay the setting, correct the proofs . . . Pest, February 9th, 1859.” Signed: “Dr. Semmelweis, Imperial and Royal Professor.”
74. Nat. Arch., 10 404/1866.
75. *OH* (1862) p. 244.
76. While Semmelweis was professor, the official and scientific circles had not rejected the truth of his theory, but nothing was done as far as general medical practice was concerned. When his successor was appointed, the medical faculty was not interested whether he would continue Semmelweis's work. At his death, there were four candidates for his chair among whom also his former colleagues: József Fleischer and János Maixner, lecturers at Semmelweis's clinic, Karl Mayrhofer lecturer at the 1st Obstetric Clinic, Vienna, and János Diescher (1813–1883), Professor of Medicine in the surgical course. The last named was appointed to the chair of obstetrics on July 14th, 1866. Diescher, who had previously been for 8 years *obstetricator publicus* (municipal obstetrician), and had also been lecturer at the Obstetric Clinic was more interested in his private practice than in his clinic. He did not adopt the Semmelweis theory on puerperal fever. Vilmos Stauffer said at the occasion of Diescher's appointment: “. . . The authorities here were not very concerned about Semmelweis's teachings, nor did they care whether his successor approved his prophylaxis or not, so they wisely appointed a pharmacologist to his chair.”
77. *OH* (1939) pp. 702–705.
78. Both his letter to the Academy and Navratil's letter clearly prove the patriotic feelings of Semmelweis, leaving no doubt that he considered himself a Hungarian. It is evident from Navratil's letter that although Semmelweis was far from satisfied here, he never wished to go back to Vienna, as some biographers seem to believe.

Chapter Five

Semmelweis Seeks Publicity

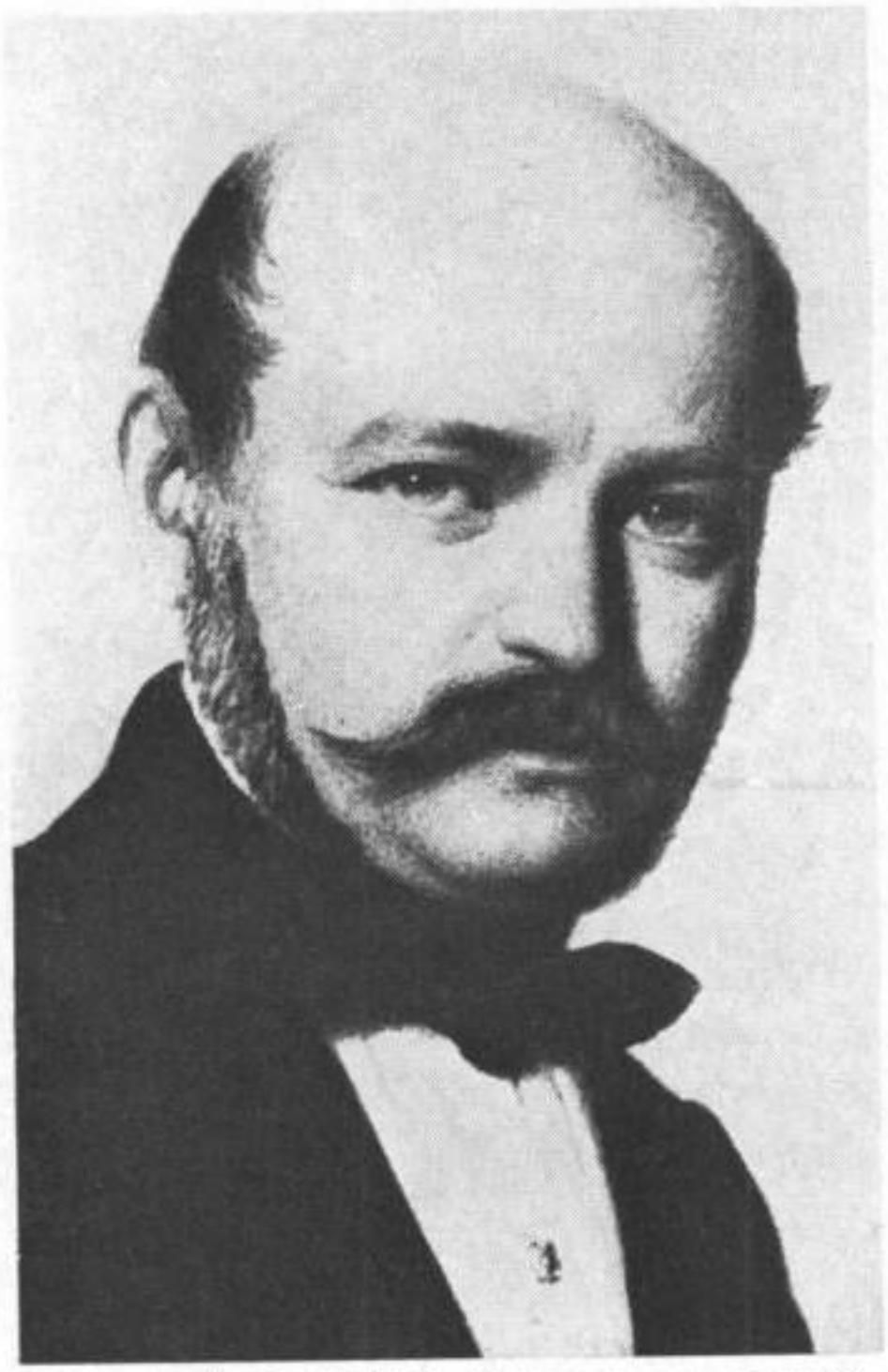
His first writings about puerperal fever — The Aetiology, Concept and Prophylaxis of Puerperal Fever — Semmelweis's book reviewed in Hungarian medical periodicals — World-reaction to Semmelweis's book — Literary offensive: the Open Letters — Semmelweis's "Aetiology" and posterity

His First Writings about Puerperal Fever

Since his address to the Medical Society of Vienna in May 1850 Semmelweis had remained silent. He was firmly convinced that the evident results of his discovery would speak for themselves and there was no further need of proving his theory. As his discovery was widely known he imagined that such an obvious truth would triumph even if he did not write and speak about it. In the late eighteen-fifties, however, he began to understand that it was a mistake on his part not to have published in full the authentic text of his teachings. In 1860 he nostalgically comments, remembering the wilful distortions of his teachings: "The exact birth-day of my teachings happens to be in the second half of May 1847. Answering the question after twelve years whether my teachings have fulfilled their mission, is not exhilarating. It is true that I have not expounded it so far as this length, yet its essence had been made public . . . and, at that time, I sincerely believed that even a brief comment would be sufficient for those experts involved in the fight for human life to start thinking, especially since it concerned a disease which filled them with horror" [1]. Finally realizing that he was guilty of an omission, Semmelweis became more and more convinced that he had to seek publicity. We must also remember that, though a university professor, he could boast of no printed publications,— when a man like Karl Braun had been appointed Professor of Obstetrics in Vienna in 1856 mainly on the basis of his scientific contributions.

After some insignificant addresses to the Medical Society of Pest–Buda in 1856–57, he delivered his epoch-making lecture "On the Aetiology of Puerperal Fever", with János Wágner in the chair, on January 2nd, 1858. It was continued in three further parts on January 23rd, May 16th and July 15th in the presence of all scientists who counted in the Hungarian medical world.

Markusovszky commented on this lecture: "Semmelweis expounded his teaching with such conviction before our society that only a man is capable of possessing who not only can fight for its truth but vouches for it with his life. His dedication to his work was evident at the meeting of the Medical Society and it deeply moved all those present" [2].



Semmelweis in 1857 (painting by A. Canzi)

The lecture appeared in the first half of 1858 in seven sequences carefully worded. This was, at the same time, Semmelweis's first printed contribution to puerperal fever. It was reviewed in the periodical *Indian Lancet* in 1860 by Theodor Duka, who found a close parallelism between Semmelweis's teachings and the prevailing English attitude [3]. Semmelweis was prompted by the review to write his next important article entitled: "The Difference between my Opinions and those of English Obstetricians on the Aetiology of Puerperal Fever", in which he discusses at length the difference between the English contagionists on the one hand and his own infection theory on the other. Semmelweis clearly wished to dissociate himself from the contagionist view, which considered the sick puerperae and their cadavers as the source of contagion, and brought erysipelas and typhus into close relationship with puerperal fever. The contagionists believed that puerperal fever was a specific infectious disease. Semmelweis declared categorically: "No contagious disease is conveyed but by a similar contagion. Caries cannot be responsible for the smallpox epidemic. Consequently, puerperal fever is not contagious, but conveyable from the sick to the sound puerpera by means of decomposed animal material" [4].

The Aetiology, Concept and Prophylaxis of Puerperal Fever

It was at the end of October 1860 (publishing date: 1861) that his momentous work, *Die Aetiologie, der Begriff und die Prophylaxis des Kindbettfiebers* appeared [5]. Semmelweis had spent a year and a half collecting his documented material before placing his book before the public.

In the Introduction to his work he uses the following words: "It may be considered as a proof of my aversion to polemics that I have left unanswered so many attacks, but I believed that I could let the truth open a way for itself. After waiting for thirteen years I find that no amount of progress has been made which should be necessary for the welfare of mankind . . .

I have been made responsible by fate to reveal the truth which this book contains. I have given up the hope that a just and righteous cause can emerge

Pest, 1858. 1. sz. Január 10.

Előfizetési ára: helyben félév 4 fr. egyszer 8 fr. ... félév 4 fr. 30 kr. egyszer 9 fr. pp. A lapot illető ... Megjelenik minden Vasárnap ... kerületnél ... 10-dik szám, ... 12-dik szám.

ORVOSI HETILAP.

Honi és külföldi gyógyászat és kórbuvárlat közlönye.

Dr. Markusovszki L. Felelős szerkesztő. Müller Emil, kiadó-könyvnyomdász.

Második folyam.

Tartalom: A gyermekágyiláz kóroktana, Dr. Semmelweis J. tanártól. — Oppolzer tanár bécsi belgyógyászati kórodájából II. Ülzsába. közli Politzer A. — Újabbkori tapasztalatok az emberben élődő állatokról. Közli Chyzer K. — Gyógyszertani közlemények. Újabb gyógyszerek. Iblany. Török J. gyógyszerésztől. — Pepsint illetőleg. — Vegyesek. — Figyelmeztetés

Tarca „Az Orvosi H-tilap" 1858. kezdetén. — Lapszemelvény.

A GYERMEKÁGYI LÁZ KÓROKTANA.

(Aetiologie des Puerperalfiebers.)

SEMMELWEIS egyetemi tanár.

A szülészet az összes orvostannak azon ága, mely ennek fő foladatát, — tudniillik a veszélyeztetett emberi élet megmentését számtalan esetben a legszembeötlőbben oldja meg. Számtalan eset közül, csak a haránt fekvést akarom megemliteni. Anya és gyermek bizonyos áldozati a halálnak ha a szülés a természetre bizatik, holott gyakorlott szülész keze majdnem fájdalmatlan, alig nébány percig tartó, műfogás által mindkettőt menti meg.

A szülészet ezen előnye melylyel még elméleti előadásokban ismerkedém meg, jólehet tökéletesen igazolva lón előttem, midőn alkalmam lett a bécsi nagy szülkórodán a szülészetet gyakorlati oldaláról ismerni; de fájdalom azon esetek számát, melyekben a szülész ily üdvhozólag hathat, aránylag enyészőleg parányinak találtam az áldozat nagy számához képest más esetekben melyekben a segitség oly végtelen gyönge; a szülészet ezen árnyoldala a gyermekágyiláz.

Háromféle ok van, melynek a gyermekágyiláz származása tulajdonitható, tudniillik a szórványos (sporadisch) helyi (endemisch) és járványos (epidemisch). Tapasztalataim által, melyeket a bécsi szülkórodában tennem sükerült, azon meggyőződéshez jutottam miként a gyermekágyiláznak semmi járványos oka nincsen, hanem hogy egy eddig ösmeretlen helyi (endemisch) ok volt az, melynek a számtalan beteg áldozatául esett.

Történelmileg akarom előadni, mikint lettem kétkedővé a járványos gyermekágyiláz tana fölött, miként fedezém föl az irtóztatos halálozás valódi okát melynek eltávolitásával, a halálozást is nagy mérvben szerencsésen meggátolni sükerült.

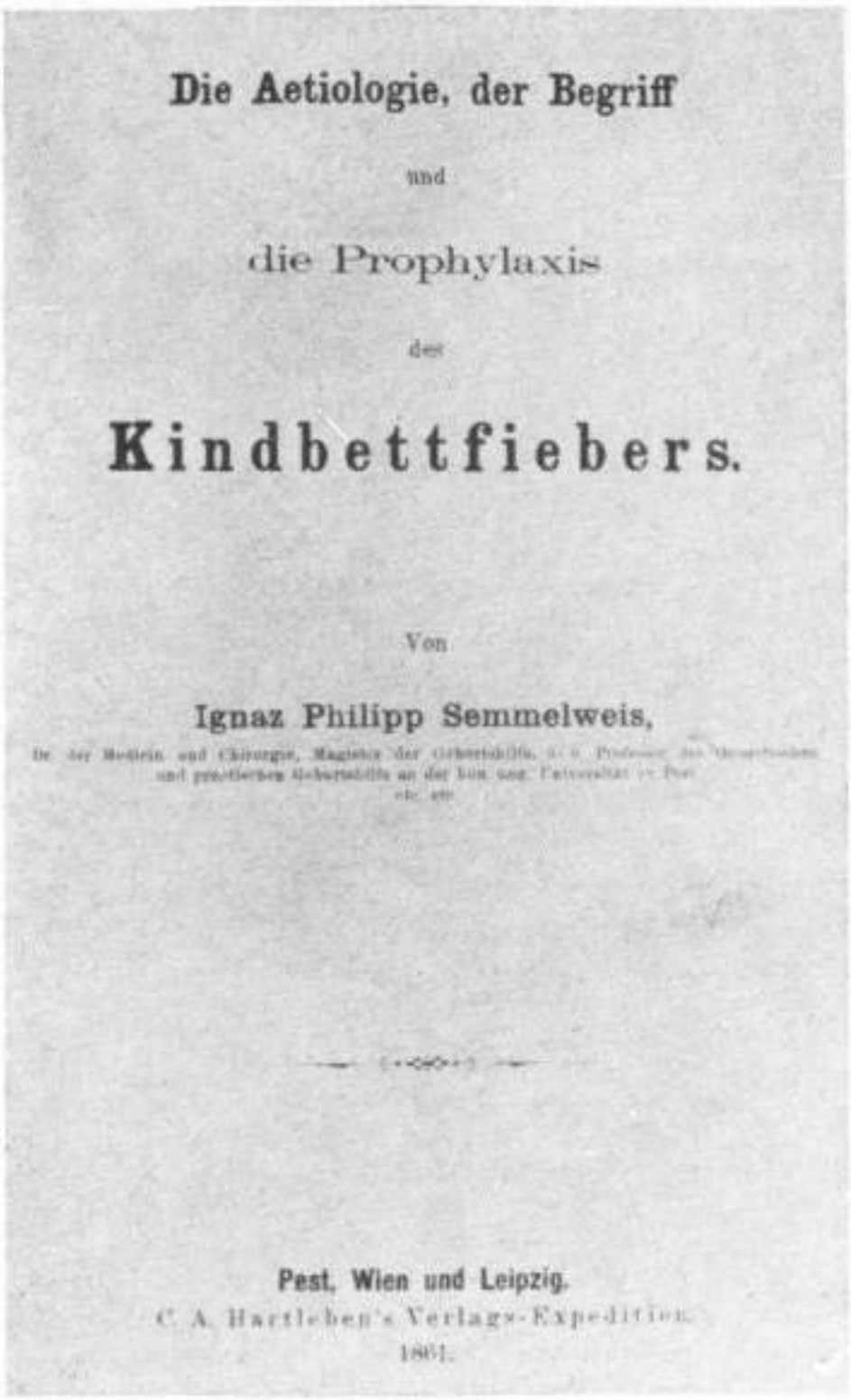
Bécsben két szülészeti osztály van és pedig oly kapcsolatos összefüggésben, hogy mindkettőnek ugyanazon egy előszobája van. A fölvétel váltakozva minden 24 órában majd az I, majd a II osztályon történik. A fölvételben a kettő között az a különbség; miként azon osztályon hol a szülészek képeztetnek, mely egyszersmind I-nek hivatik, hetenkint egy fölvételi nappal több van, mint a II-kon, vagyis egész héten 4-szer történik fölvétel; a II. osztályon pedig, hol a bábák nyernek képezést, hetenkint 3 a fölvételi nap; és igy a szülészek osztályára évenkint 52 fölvételi nappal több jutott mint a II-ra.

Mindkét osztályon körülbelől ugyanannyi szülés jő elő, névszerint 3 ezer és egynehány száz mindenik osztályon külön. Évek hosszu sora óta a halálozási arány még is oly különböző volt, hogy mig azon osztályon, melyen a bábák képeztetnek 3 ezer nehány százra menő szülés után a halálozás közép számitás szerint a 60-at meg nem haladta, addig ugyan annyi szülés mellett a szülészek osztályán a halálozási szám 600—800 közt ingadozott.

Ha ez járványi befolyásnak leendett eredménye, akor a betegségi és halálozási számnak szükségképen mindkét osztályon egynek kellett volna lennie, vagy e tény kimagyarázására, és a különbség megfejtésére föl kell vennünk, hogy a járványbefolyás csupán 24 óráig tartott. és

Semmelweis's first study on puerperal fever published in the *Medical Weekly* (1858)

victorious without a struggle. I must no longer think of my own peaceful disposition but must remember the lives that should be saved, depending on whether I or my adversaries win. I must overcome my own nature and seek publicity because my silence has had a detrimental effect on the cause. The many hours that I have spent in bitterness have not served as a warning; I have survived; my conscience and conviction will help me to suffer whatever else may be in store for me." Later he goes on: "It would be a crime to remain silent any longer and trust to time and unbiassed observation for my teachings to prevail. The medical literature of the past 12 years has not ceased publishing its reports on new outbreaks of puerperal epidemics . . . The medical books published in the


Die Aetiologie, der Begriff

und

die Prophylaxis

des

Kindbettfiebers.

Von

Ignaz Philipp Semmelweis,

Pest, Wien und Leipzig.
C. A. Hartleben's Verlags-Expedition.
1861.

Title page of the *Aetiology*

meantime either ignore my teachings altogether, or assume a hostile attitude towards it: the medical faculty of Würzburg for instance, rewarded a monograph published in 1859 for no other reason than that it rejected my teachings concerning the aetiology of puerperal fever, and I shall not hesitate to name those chiefs of lying-in hospitals who have successfully applied my doctrine while attacking it, and attributing their results to other circumstances. My defiant attitude to such scandalous events has finally prevailed upon me to commit myself to paper."

The first part of the book discusses the history of the discovery of the aetiology of puerperal fever, the notion of the disease and the prophylactic methods. Semmelweis takes, one by one, all supposed causes and factors which according to general belief contribute in the causation of puerperal fever and in the outbreak of epidemics, such as the overcrowded state of hospitals, contaminated rooms, bad ventilation facilities, rough techniques of the examining medical students, the mixing up of bedding and linen with those of other wards of the hospital, the common cold, the spirits or wounded modesty of the lying-in patient, etc.

To begin with, he describes his experiences in the obstetric clinics of the General Hospital of Vienna where he was struck by the differences in mortality in the two clinics which he could not reconcile by the existing theories concerning the accepted aetiology of puerperal fever. Gradually he became convinced that the infection was being conveyed by the examining physician himself. After fifteen years he was still disturbed by the weight of the discovery, and when discussing its history he repeats the often-quoted heart-rending self-confession: "It would be contrary to my conscience not to confess here that only God knows the number of women whom I have consigned prematurely to the grave. I occupied myself with cadavers to a far greater extent than most obstetricians. The same has happened to other physicians, and by emphasizing the truth, I wish to bring out a fact which, to the misfortune of mankind, has remained unknown for centuries. However painful and depressing the recognition may be, there is no advantage in conceal-

ment; if the misfortune is not to be permanent, the truth must be brought home to all concerned."

In the next part of his book, the concept of puerperal fever is defined. His definition still holds today, however more advanced our knowledge may be: "I maintain that puerperal fever is an absorption fever, produced by the absorption of decomposed animal organic material. Puerperal fever is not a specific disease but a variety of pyaemia."

He describes at length all the cases and ways by which a lying-in woman may be infected. "The carrier of the decomposed animal organic material is the examining finger, the operating hand, the bed-clothes, the instruments, the sponges, the bed-pan, the hands of midwives and nurses which come into contact with the excrement of sick lying-in women and other patients, and then come again into contact with the genitals of women in labour or just confined. In other words, the carrier of the decomposed animal organic material is everything that is infected with the latter and then comes into contact with the genitals of the patient. The same infection may occur . . . through absorption of the decomposed animal material in the prosector, the surgeon, the patient operated on in the surgical wards, etc."

As regards external infection, Semmelweis believed that the main source was the "decomposed animal organic material" conveyed by means of the hand of the examining physician or midwife; nevertheless he attributed the same importance to objects infected by the decomposed organic material (e.g. instruments, bed-clothes, the bed-pan, etc.). But he also recognized that the source of infection could be not only the absorption of decomposed animal material conveyed from without, but decomposed animal material produced within the organism, e.g. in the uterus itself, through the decomposition of parts of the placenta and mucosa. He calls the absorption of these materials self-infection (*Selbstinfection*). In these cases, puerperal fever may be produced without the intervention of an outward agent or examination, but from within [6].

The chapter "The Prophylaxis of Puerperal Fever" contains not more than five pages, nonetheless it has not lost anything of its significance until this day. "The task of prophylaxis", points out Semmelweis, "in puerperal fever consists in preventing the decomposed material from being conveyed from outside." Prevention can be, in the majority of cases, very effective, and Semmelweis described the prophylactic measures. "Decomposed organic material should not be introduced from without and should be removed before it is absorbed by the organism." With this definition Semmelweis establishes the "non-infection" theory of modern surgery. He emphasizes the importance of the theory when he says: "Let me appeal to all the governments of the world, to introduce a law to prevent any person employed by lying-in hospitals from soiling his hands with decomposed organic animal material."

The second part of the book bears the title "Correspondence and Opinions in the Literature for and against my Doctrine". Here Semmelweis takes up the charges directed against him one by one and answers them. His arguments are

always interesting and convincing, he tries to remain unbiassed however much worked up by indignation. In this part is reproduced the full text of Hebra's two addresses on the Semmelweis discovery, his exchange of letters with the English obstetrician, Simpson. Routh's letters from England, his correspondence with Michaelis, Levy, Litzmann, Tilanus and other obstetricians, as well as a full description of Skoda's lecture. It is in this part, too, that we can read about Semmelweis's refutations to the commitments of Scanzoni, Silberschmidt, Zipfel, Lumpe, Hamernik, Bamberger, Seyfert, Kiwisch, Virchow, Martin, Karl Braun and Dubois.

His presentation and objective discussion of the case in point is often interrupted by passionate abuse. He could not check the flow of his indignation because many innocent lives were still being sacrificed on the altar of stubborn blindness, and in the uncompromising tone of the initiated he continued to chastise those who, to his mind, prevented the spread of his doctrine.

His uncompromising tone was consciously applied. He openly refers to the motives which induced him to write: "I am doing my best to be entirely objective and am recording not only my own opinion but whatever has been raised against it. But I always give an answer, however unpleasant it may sound to the colleagues who resent it" [7].

In spite of his bitter argumentative tone, Semmelweis introduces the idea of professional conscience and indebtedness to human society, and an unconditional observance of the idea of justice. Reading his book offers much satisfaction even to-day. His statistical evidence is just as convincing as his ruthless logic. There are repetitions in abundance, which may be displeasing to a good reader, but that was Semmelweis's method of writing. While trying to give clear definitions to his ideas, he produces evidence over and over again, re-grouping his statistical figures, as if facing his opponents, arguing with them and refuting their theories.

Semmelweis's objective method and his devoted diligence are evident in the obstetric statistics he made in Vienna. They go back to 1789 and are contained in 64 different tables. Semmelweis was the first in medical science to use statistical figures to prove his point. In those days the role and importance of statistics had not yet been recognized in any field of research.

Pertik approved of the method used by Semmelweis to support his doctrine when he admits: "What amazing logic in the exact analysis of the statistical figures on the lying-in hospitals in Europe, what insight to reveal the truth in those figures, what immense energy in his criticism when crushing the supposed causes of puerperal fever! In his indomitable sense of justice his mind was capable of performing more than on any other occasion" [8].

Semmelweis had an unshakable belief in the truth of his doctrine. In a postscript to his book, he seems to prophesy things to come: "However painful and depressing it is to consider past events, I feel confident of the future, and can see with my mind's eye that the time will come when in the lying-in hospitals, all over the world there will occur no other cases of puerperal fever than those caused by self-infection".

Semmelweis's Book Reviewed in Hungarian Medical Periodicals



Lajos Markusovszky

The Aetiology came out in October 1860. Very soon after a significant critical review of the book appeared in the *Medical Weekly*, written by his friend, Lajos Markusovszky [9]. The latter who never once doubted the truth of the great discovery, simply eulogized the author and his doctrine in his thorough analysis. "The book I am reviewing has certainly not escaped the attention of our readers, yet by recognizing its true merit I hope to enhance the importance of our periodical. It is not an ordinary book written by experts who simply put their thesis into a new shape by enumerating their points, and adding a few observations, and which appear on the shelves of the bookshops year after year. As I perused it and considered its effect on myself, I must confess that it is more than a scientific book or treatise, though each of its theories rests on pathological research, on clinical observation and statistical data, and its ratiocination is on the highest methodological level.

"Observation and experiments, the doctrine and the evidence all disappear while we are reading the book, and our minds are captivated by the idea, the love of humanity which animated the man who wrote it, convinced of the truth of his doctrine and the good it will do to mankind. The lines that our eyes follow are not composed of dead letters: the theories here presented are not based on fleeting experiments and data endeavouring to solve a mystery by false notions and empty-sounding phrases, they are not the cold products of abstract logics, but revelations in which the heart, inspired by truth, has an equal share with the scrutinizing intellect and sincere goodwill and the mind demanding the strictest logic.

"All this is confirmed by the discovery, the history of the work, the conscientious and assiduous arrangement of the data relating to the subject: inspiration and keen enthusiasm pervade the whole book, every detail and every thought is infused by powerful conviction which can emanate only from a doctrine we firmly believe in and for which we would gladly vouch and even stake our lives. The greatness of the book is attested by the complete identification of the author with his doctrine, which was manifest at the time Dr. Semmelweis first discussed

the subject before a meeting of the Medical Society in Pest, when he deeply moved his audience. Whenever the question of the aetiology of puerperal fever crops up, it is capable of rousing the same enthusiasm . . . It is somehow understandable that before the existence of the doctrine and before its propagation physicians should have deceived themselves and the world with what was an *olla potrida*, but now when the value of the theory, the rules of the experiment, the method of the research and theory have been fully recognized, by the laws of logic and the nature of the subject, it is quite absurd that we should still hear *ex-cathedra* theories and aetiologies. It is preposterous that when accounting for the causation of puerperal fever medical students should still speak of cold and heat, hunger and gluttony, hyperinosis and uraemia, plethora and hydraemia, congestion and inopexia, activity and inertia, sorrow and outraged modesty, etc., etc.—and all this without blushing, instead of frankly confessing their ignorance. We could account for such statements only by a complete lack of logical thinking and philosophical knowledge if we did not know that dogmatic pride and other human frailties still existed, producing beliefs, bias and prejudice, which like an "unceasing ague" go down from generation to generation . . . Instead of denying the above causes, the German and French obstetricians have even added new items to the list. The *genius endemicus* and *epidemicus* have not been ousted from the field of childbed fever; on the contrary, the greatest medical authorities have risen in their favour in the Paris academies, and, in spite of the discovery of Semmelweis, they still prevail in the lying-in hospitals in Vienna. Ever since the days of Boer, unbiassed, sober experience cannot be tolerated there.

". . . In the introduction to his book, Semmelweis declares that he is not fond of writing and that he is hostile to polemics. We are fully convinced of the truth of both of these statements. We can easily confirm the first, as it was our paper, the *Medical Weekly* which had the honour of persuading the author to submit his experiences on puerperal fever, as appearing in our columns . . . But it seems that as soon as he started writing and found his new doctrine faced with the mass of inanimate causes, he clashed off one sheet after the other, sending them in a hurry to the press without re-reading them. So much so, that the book, planned for six sheets, grew into a volume of 34 sheets . . . The second statement—that Professor Semmelweis dislikes polemics may sound strange to the reader who taking up the volume will find that at least one third of it is controversial and refutes opinions conflicting with his own theory. As an opponent Semmelweis can be formidable. When visiting his colleagues, Semmelweis does not wear his gloves. He does not beat about the bush but says bluntly what anybody else would keep to himself, or hand over in a sugared pill with a thousand apologies to his guests. One thing is true, however. No adversary has the right to be offended for not receiving equal treatment: they are all equals, without regard to title, station or fame, from the humble Silberschmidt to Scanzoni, the Court Councillor, and M. Dubois, the obstetrician of Her Majesty, the Empress of France. They are all reprimanded for their reckless and illogical behaviour, for their unfounded

declarations, and Semmelweis points out where they run contrary to the testimony of observation. It is in the interest of the subject that they should be treated as equals, and it is definitely in the interest of the dispute that the rude words should be excused which the author utters as a sign of his affection for the case in point as well as humanity.

"For fifteen years Semmelweis had remained silent suffering the abuse of his colleagues without uttering one word in reply to the unfounded accusations. Should he have kept silent when his turn came to reply? He saw that many of those who, owing to progress in medicine had accepted his doctrine, nevertheless continued to abuse him, and that others with no ability to criticize but only to repeat and collect information, thought that by adding his doctrine to the supposed causes they could have some pretensions of being progressive, without realizing the contradiction . . . Just like the Greek philosopher who after the solution of his mathematical problem cried "Eureka!", Semmelweis might have done the same because in the solution of his problem his heart, his honour, and his mind were equally involved, and because by developing his science he had also found relief in the thought that there was hope for his patients they not being doomed to death . . . The blissful worth of this simple discovery means ever so much more than the most subtle system holding the world of wisdom in its grasp for centuries without either science or mankind profiting by it and serving only the vanity of its creator and the blind comfort of the docile masses. The value of Prof. Semmelweis's discovery, and the sober trend of his thinking which led him to achieve it, deserve all the more appreciation if we consider that he dared declare war on the pet *genius epidemicus* when, among doctors, it was possible to attribute whatever they liked to it. His discovery was made at a time when the aetiology of blood poisoning was not known, when absorption of pathological discharges, pyaemia, uraemia, embolia and similar well-known symptoms and diseases had not yet been admitted into medical science . . . The thanks that the discoverer got corresponded to the prevailing views in medicine. This is, however, the common fate of all discoverers and discoveries. We are not surprised that most people favour men who stand up for traditional convictions and prejudices, ready to defend them and propagate them, at whatever cost. Anybody defying public opinion (in this case, the opinion of scientists), and daring to undermine time-honoured beliefs, is a rebel and if it is not possible to convince him by reason, he should be destroyed. This was the fate of our author. Famous obstetricians and scientific academies, biassed by the prevailing doctrines, could not reconcile themselves to a simple solution, it being far too natural to be scientific (!). They belittled and despised it, not even thinking it worthy of consideration, and instead they carelessly introduced the most contradictory factors into the aetiology of puerperal fever. For these men the Semmelweis solution did not throw any light on the subject, it only confused matters, and so it was relegated to the status of a simple paragraph in the textbooks on puerperal fever, one more factor in an aetiology which could not be said to lack relevant causes (!)."

The other Hungarian medical periodical *Medical Practice* published two reviews of the book. The first was written by Dr. Földváry who praised highly its merits and encouraged Semmelweis to ignore his enemies; the second came from the pen of a former assistant, Dr. Fleischer, who said that the monograph was an epoch-making document in medical science [10].

World-Reaction to Semmelweis's Book

After the publication of his book, Semmelweis sent copies to all the prominent obstetricians and to many medical societies abroad. The library of the Royal Society of Medicine in London has a copy in its possession sent by Semmelweis to his English friend and colleague, C. H. Routh. There is a letter written in English by Semmelweis, attached to the title-page. It is an interesting document, the text is given below (without the mistakes in spelling of the original):

Pesth, 22(5)61.

Dear Friend,

As you have been so friendly in the year 1848 at the meeting of the English Doctors in London, to bring forward a discussion on my opinion about the origin and prevention of fever in child bed, I take the liberty, having just finished a complete work upon the same subject to send it you with the request to mention it again at the same meeting.

I have also sent my work to Webster, Copeland, Murphy, Simpson, Weber.

Thanking you before for your trouble and hoping to hear something of you very soon.

Your sincere friend
Ignatz Semmelweis [11]

He impatiently waited for some sign that his book was fulfilling its mission. He did not have to wait long, but most reactions were unfavourable.

Credé's [12] review on Semmelweis's work may be called fair: he admitted that in the prophylaxis of childbed fever his merit was undoubted ". . . no one can deny what has been known for long that the author has outstanding merit . . ." [13]. "Many obstetricians however", he stated in what followed, "believe that as far as the aetiology of the disease is concerned, there may be further unknown factors. The book is worth studying by every expert, yet it does not serve the cause to call everybody who does not agree ignorant or even a murderer."

The book was favourably reviewed by Robert Froriep [14]. The *Medical Weekly* commented as follows: "Froriep in No. 18, Vol. II. 1861 of his *Notizen* spoke highly of I. F. Semmelweis's book about childbed fever, the latter having been reviewed in these columns. He said: 'The author's discovery is one of the most significant events in modern medicine, so we wish to present it to our readers in a special number, discussing the essential points herewith' " [15].

Frantz Zipfl [16] on the other hand did not agree with Semmelweis. He emphasized that puerperal fever was caused by epidemic influences, and was affected by miasma and contagion as well.

Hecker insisted that in the prevention of septic processes in obstetrics and surgery it was wrong to emphasize the exclusive role of cleanliness.

Joseph Späth, Professor of Obstetrics in the Josephinum of Vienna, in an article written on general medical questions in March, 1861, wrote the following among his comments on obstetric literature: "... Among those who made serious contribution to the understanding of puerperal fever the names of Buhl, Martin, Klaproth, Wagner and Förster should be mentioned, they explained the connection of peritonitis with salpingitis." He simply dismissed Semmelweis's book by stating that it contained nothing new as his views had been known for the last 14 years [17].

August Breisky [18], obstetrician in Prague who had an expert knowledge of pathology devoted a long article to Semmelweis's book and teachings, which we may call unbiassed, up to the point where he states that, in the aetiology of puerperal fever, certain factors must still be considered unknown. He ended by rejecting the Semmelweis doctrine, calling his book sarcastically a "naive" affair, "the Koran of puerperal theology". He insists that Semmelweis has not succeeded in proving the identity of puerperal fever with pyaemia, the principle of the "decomposed organic material" in itself not explaining anything.

Markusovszky took it upon himself to answer some of Semmelweis's critics in an article entitled: "Some Voices against the Semmelweis Doctrine Concerning the Aetiology of Puerperal Fever" [19]. He replied to Breisky so effectively that, although his article was written in Hungarian, it found its way into world literature.

Markusovszky had wisely seen that many obstetricians had misunderstood the idea of "decomposed organic material", regarded by Semmelweis as the only source of infection in the aetiology of puerperal fever, and in 1861 he suggested that certain histological and chemical investigations should be made.

Semmelweis himself had not considered the aetiology of puerperal fever as complete, but having established the source of puerperal infection and prophylactic measures for its prevention, he wanted to concentrate all his energy on the practical realization of his doctrine, that is, he wanted to see puerperal fever completely eradicated, and at that stage was less interested in articles discussing the specific cases of puerperal fever and the close definition of the actual nature of the organic substance. It was only Markusovszky's genius which in 1861 proposed what was only materialized at a much later date.

In reply to Breisky's hostile remarks, Markusovszky said: "It is true that the identity of pyaemia and puerperal fever could perhaps be supported with additional evidence besides aetiology, course and pathological product,—yet in medical science few things have been better demonstrated. Let us also admit that statistical data, however exact, can be further improved—or else they may be dismissed, as the reviewer seems to have done. Let us admit that there were times when the midwives were even dirtier than today, and that soiled linen may be found also in the houses of the rich, not to speak of the poor, just as in the hospitals, and yet the dreaded disease did not always flare up, — just

as not every contact with a syphilitic ulcer will produce infection. Let us also admit that decomposition is quicker in southern regions than in northern ones (in hot rather than in cold climates), without producing more cases of puerperal fever,—especially if autopsies are but rarely performed. It is true that lying-in women suffering from medullary cancer can be free of puerperal fever—just like patients with syphilitic ulcer can be free of general syphilis. It is also true, finally, tl at in spite of hands disinfected by the chlorine handwash, the disease may break out, and it can stay away without disinfection,—since it is not only by means of the hand that the disease may be conveyed. Yet these factors, however much Mr. Breisky insists on them, prove nothing against the Semmelweis doctrine, nor are they suitable for judging it. On the contrary, by means of it, one can better and more naturally understand the above factors than by any other prevalent theory.

"The rule of logic stipulates in all observations that if we are able to attribute a phenomenon to a certain source, we should look for this cause in every individual case, or else we lose grip completely and lose ourselves in the darkness of arbitrary supposition.

"The clinical observations, statistical figures, pathological findings and other experiences have all led Dr. Semmelweis to the simple and logical solution that the application of the chlorine handwash stops the outbreak of the disease, and that puerperal fever bears great similarity to pyaemia. Let us not forget that lately septic corpuscules have been discovered in the air by Prof. Eiselt, and that the *olla potrida* believed to be the cause of puerperal fever both in France and Germany,—these seem to confirm the Semmelweis doctrine. Consequently, the prophylaxis recommended by him should be adopted by every conscientious physician.

"In my opinion it has still to be demonstrated by a process of exact investigation what is the nature of that organic material which produces the infection, and what are its histological and chemical relations; in what particular manner it obtains access to the organism; how does it behave chemically and physiologically; what are the conditions of its absorption and action since it does not seem to act in all cases; what is the nature of the physiological processes by the combination of which puerperal fever occurs sometimes without any exudation in one case and in another case with accompaniment of extensive exudation and metastases, etc.

"The investigation into the aetiology of puerperal fever is not yet complete, so much is certain. It would not be complete even if the decomposed animal material as source of infection were universally recognized. Even the definition which Prof. Semmelweis employed must be considered provisional, inasmuch as the elements entering into it—pyaemia, absorption and the concept of fever—still form subjects for research . . .

"These are ideal stipulations, nevertheless they do not belong altogether to the mysteries of Hippocrates. All these questions must still be cleared up. But why should they be the task of obstetricians? And are we to draw the conclusion

that, because the new doctrine has not as yet been explained in every detail, it is therefore false, and that the ancient definiteness of epidemic darkness is to be preferred?

"Considering all this—concludes Markusovszky—we certainly cannot demand from the relatively new knowledge, and from a single individual, the solution of all the questions to which answers can only be obtained with the aid of all the branches of natural sciences . . . We can certainly demand both from the author, and from his opponents full and effective collaboration in the complete development of this important doctrine, in order to discuss their experiences objectively."

For years Markusovszky's ideas had remained unknown, until they were quoted in the book of Jakab Bruck (1887) when his clarity and sagacity however aroused much admiration [20].

"We cannot but admire Markusovszky's prophetic arguments", said Fischer, "yet we have to confess that even today we are miles away from the realization of his programme" [21].

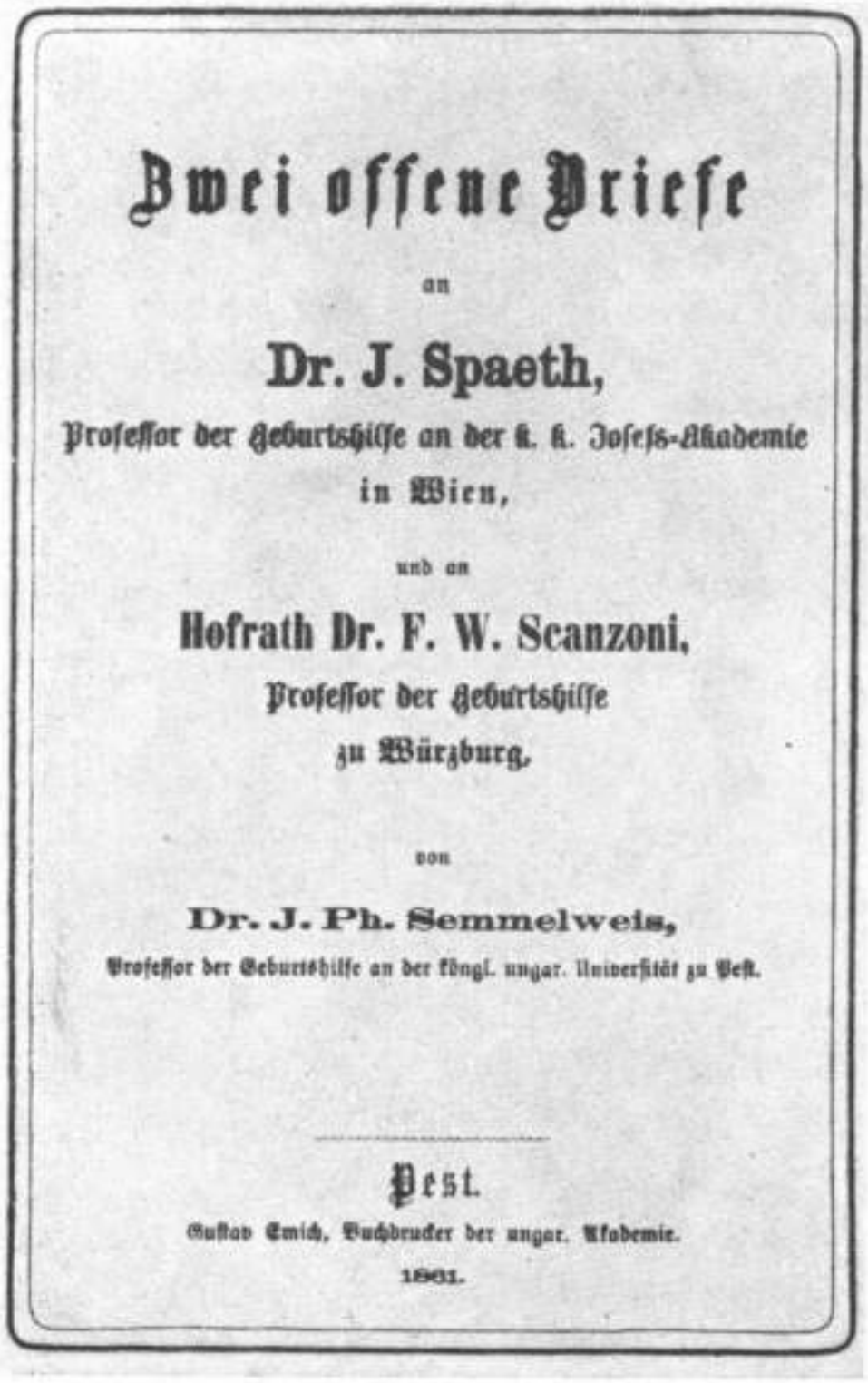
Tauffer writes ". . . after the happy companionship of youth, Markusovszky never ceased hastening to his friend's rescue, always believing in his discovery in the hours of trial and humiliation. He was his protagonist, always ready to throw in his lot with him. Markusovszky's eagerness to fight on the side of Semmelweis is best demonstrated by his attack on Breisky" [22].

Schürer von Waldheim says: "Great respect is due to this man of wide perspicacity who was fully conscious of the limitations of the Semmelweis discovery and clearly pointed to the spot where further research was necessary. What a pity that his masterful article was written in Hungarian only. It would have deserved to be translated into all the cultured languages of the world to obtain proper recognition!" [23].

Tibor Győry also recalled the memory of Markusovszky with great reverence, saying: ". . . he was not only an intimate companion of Semmelweis's youth, but also his inspirer throughout a lifetime, his consoler in evil days, who wrote the most touching apology of his doctrine in 1861 . . . Markusovszky, inspired by the muse of science had predicted the trend of future research by insisting in 1861 on the histological and chemical study of the infection" [24].

Literary Offensive: the Open Letters

Semmelweis had every right to believe that the documentary evidence in his book would dispel whatever misunderstanding still existed in connection with his teachings. He waited and feverishly watched the reactions, but soon had to realize that little evidence was forthcoming from the outstanding obstetricians of the world. Apart from some short notices, they either ignored the book or described it as insignificant,—a book that was written with so much conviction, almost with his heart's blood! The weight of recognized authority, however, prevented him from witnessing the triumph of his teachings.



Zwei offene Briefe

an

Dr. J. Spaeth,

Professor der Geburtshilfe an der k. k. Josefs-Akademie in Wien,

und an

Hofrath Dr. F. W. Scanzoni,

Professor der Geburtshilfe zu Würzburg,

von

Dr. J. Ph. Semmelweis,

Professor der Geburtshilfe an der königl. ungar. Universität zu Pest.

Pest.

Gustav Emich, Buchdrucker der ungar. Akademie.

1861.

Title page of the Open Letters to Späth and Scanzoni

His sensibility was wounded to the quick by the unfavourable reception and the deliberate misrepresentation of his theory. He was still convinced that "fate had selected him to be the champion of justice". He was sure that his teaching was evident and clear; hence obvious neglect became unbearable. He could stand neglect in Vienna but now he had no longer the time to wait for victory. Losing his patience, he planned a general attack against the leading obstetricians of his time. He dipped his pen into the ink and wrote his now famous Open Letters. Semmelweis was not unaware of the fact that his action would meet with the displeasure of a good many of his colleagues: "I shall take consolation in the conviction that my action is not an end but a means, inevitable of its kind, to force many physicians to retrace their steps to the path of truth they have deviated from, at the expense of mankind, misled by the siren-voices of my enemies" [25].

Tivadar Kézmárszky in his textbook, *The Book of Obstetrics* (1904) deals with the question of the Open Letters as follows: "The losing battle made Semmelweis lose his grip. He was duly irascible faced with the obstinate disregard of his documented doctrine, despairing in the conviction that nevertheless it was his sacred duty to propagate his teachings, even with a pen dipped in gall, with excruciating weapons, defying his opponents in his Open Letters, accusing and stamping them before the world of science".

His first open letter was addressed to Professor Späth of Vienna and Professor Scanzoni of Würzburg in 1861 [26].

In No. 23, dated June 9th, 1861, the *Medical Weekly* announced the Open Letters as follows: "In this number we have the honour of reprinting the Open Letters of Professor Semmelweis addressed to Professor Späth of Vienna and Professor Scanzoni of Würzburg. In the name of humanity, Professor Semmelweis considers it his duty to call to task the adversaries of his aetiology of puerperal fever, as their scientific contributions are more apt to confuse than to clear up the real state of affairs."

No. 24. of *Medical Practice*, 1861 comments as follows on the first two Open Letters: "There are two Open Letters in the press addressed by Prof. Semmelweis to Professors Späth of Vienna and Scanzoni of Würzburg, in the matter of their misconceptions concerning the aetiology of puerperal fever. Let justice win!"

In his Open Letter to Professor Späth, among other things, Semmelweis says: "My book appeared at the end of October, 1860, and you, Herr Professor, in *Medizinische Jahrbücher*, No. 2, March 20th, 1861, p. 229 had the following to say: 'For the proper understanding of puerperal fever, Buhl, Martin, Klaproth, Wagner and Förster have furnished sufficient evidence through the definition of the relationship of salpingitis and peritonitis.' With this remark, Herr Professor, I believe that your mind had not been sufficiently lighted by the puerperal sun, which rose in Vienna in 1847, however close to you it shone . . . I carry with me the knowledge that since the year 1847 thousands and thousands of women and infants have died who would not have died, if I had not remained silent, but had protested against every misconception concerning puerperal fever which has been spread. Of this you can persuade yourself: I do not exaggerate when I say that thousands and thousands of lying-in women and newborn infants who might have been saved have lost their lives since 1847. May I simply recall to your memory what occurred in the 1st and 2nd Obstetric Clinics of Vienna from the 1st of January, 1849 to the last day of December, 1858 . . . If for the sake of easier calculation I assume that out of every 100 lying-in women 1 dies from inevitable self-infection, then as at the 1st Obstetric Clinic 1 491 died out of a total of 40 889, 1 083 died in puerperal infection who might have been saved; in the 2nd Obstetric Clinic, 841 might have been saved, as 1 183 women died from a total of 34 245. Consequently, in the two free clinics of Vienna from 1847 in the course of ten years, 1 924 died unnecessarily from exogenic puerperal infection, although an unduly high percentage has been assumed for inevitable cases of self-infection. This figure does not include those who have been transferred, nor the newborn infants, dying of blood-poisoning contracted from their mothers. In this massacre, you, Herr Professor, have participated."

Semmelweis thus tried to prove to Späth by means of the statistics of his own clinic how many lives could have been saved had he accepted his teachings.

"There is no other course open for me", he continued, "except to keep watch, and every man who dares spread dangerous errors regarding puerperal fever will find in me an active opponent". "This homicide must stop, and no one whose heart is in the right place will blame me for making use of this means."

The second Open Letter contained in the pamphlet was addressed to Scanzoni. Semmelweis considered him responsible for an article written by his assistant Dr. Otto Franqué about the puerperal "epidemic" raging in the new clinic of Würzburg in 1859. He admitted that from 99 lying-in women 33 had been seized by the epidemic and 9 had died. He attributed the epidemic to atmospheric influences, caused by the *genius epidemicus* [27].

To Scanzoni, Semmelweis wrote:

"Herr Hofrath will have learned from my letter to Professor Späth that I have made firm resolution to put an end to the murderous practices, and in order to achieve that objective I have decided to attack unsparingly all who dare spread errors regarding puerperal fever.

"It follows from this resolution that I wish to discuss an article by Dr. Otto Franqué, published in vol. IV. of your publications, dealing with the outbreaks of fever in the lying-in hospital of Würzburg in February, March and April of 1859.

"I do not wish to argue with Dr. Franqué. I am only sorry for him as he has been deceived and misled by your delusions and errors, which he has benevolently adopted . . .

"Herr Hofrath, I deny that puerperal fever is of an epidemic nature, and I repeat that it is caused by the conveyance of decomposed material into the organism from the exterior, consequently the disease is a kind of absorption fever; Herr Hofrath, if you wish to reach the same conclusion, may I suggest a closer study of my book on puerperal fever, especially my arguments presented on pp. 114–213. Here I prove with mathematical accuracy that atmospheric influences have never existed, and that the disease has always been transmitted through the ignorance of physicians and nurses, male and female, who cause high mortality among lying-in women . . .

"You see, Herr Hofrath, how readily all the phenomena of childbed fever can be explained when the only true cause is recognized, whereas you explain the unknown by even more unknown atmospheric influences.

"Yet this is not the greatest merit of my teaching. The greatest service rendered by it is that it teaches how the unhappiness wrought by the disease can be prevented with certainty and that it prescribes to the practitioner a recognized active method of prophylaxis. Your teaching, on the other hand, puts upon the practitioner the stamp of the Turk who, in fatalistic passive resignation, permits the disaster to overwhelm his lying-in patients . . .

"My doctrine is based, among other circumstances, on my experience from the middle of March 1847, until now, May 25th, 1861, in three different institutions, which were formerly annually ravaged by frightful pseudo-epidemics of puerperal fever, and in which I reduced the rate of mortality so much that it could no longer be regarded as an epidemic, and, if mortality exceeded the rate customary in our institutions, it could always be proved that, in spite of my rigorous measures, somehow or other, decomposed organic matter had been transmitted from outside into the organism of the lying-in patient. Of these instances, you, Herr Hofrath, may obtain full information on p. 111 of my book, from the bottom 3rd line onwards . . .

"Your teaching, Herr Hofrath, is founded on the dead bodies of lying-in women murdered through ignorance, and because I have formed the unshakable resolution to put an end to this murderous work, I call upon you to comply with my request:

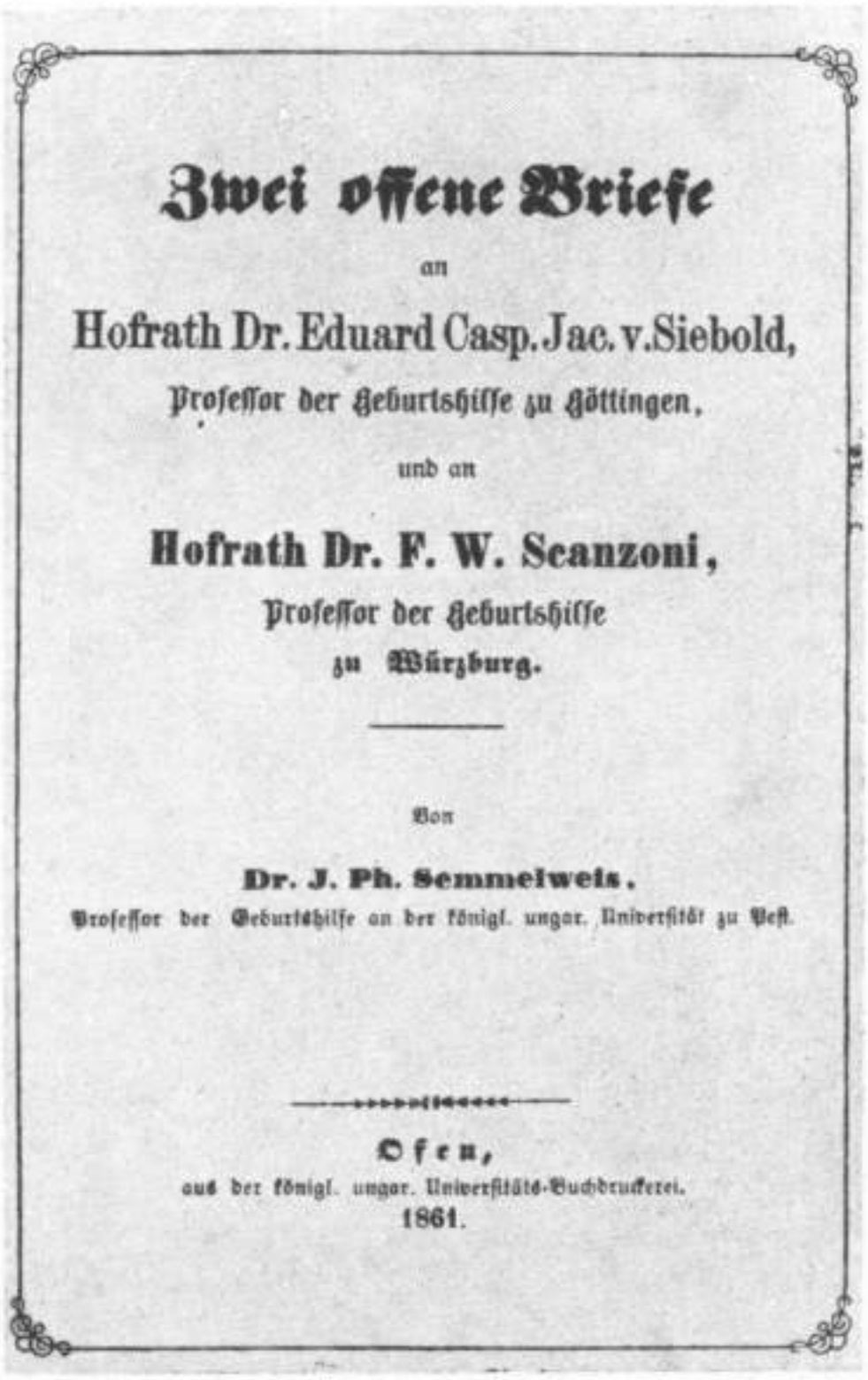
"There are only two alternatives. You can either find my doctrine right or wrong: there is no third alternative.

"If you find my doctrine wrong, may I beg you, Herr Hofrath, to give me your reasons why it is wrong.

"As a matter of fact, I have devoted p. 103 of my book to demonstrate the fatal mistakes you made in the question of puerperal fever. If my arguments do not suffice, and if you, Herr Hofrath, have further doubts, may I ask you to voice them publicly, so as to enable me to give you public instruction, — and you are not the only one who needs lessons in puerperal fever.

"Should you however agree with me and accept my doctrine unconditionally, would you please give it public recognition, not so much to satisfy me as to teach your students, who, in compliance with your principles, are daily furnishing cadavers from the lying-in hospitals.

"Should you, Herr Hofrath, without proving my doctrine wrong, continue to write in support of the doctrine of epidemic puerperal fever, and to teach your students the doctrine of epidemic puerperal fever, I denounce you before God and the world as a murderer, and the historian of puerperal fever will not do you an injustice when, for the crime of having been the first to oppose my life-saving doctrine, it will perpetuate your name as that of a medical Nero."


Zwei offene Briefe

an

Hofrath Dr. Eduard Casp. Jac. v. Siebold,

Professor der Geburtshilfe zu Göttingen,

und an

Hofrath Dr. F. W. Scanzoni,

Professor der Geburtshilfe

zu Würzburg.

Von

Dr. J. Ph. Semmelweis,

Professor der Geburtshilfe an der königl. ungar. Universität zu Pest.

Ofen,

aus der königl. ungar. Universitäts-Buchdruckerei.

1861.

Title page of the Open Letters to Siebold and Scanzoni

One month later the *Medical Weekly* announced in its 27th number, of July 7th, 1861, that Professor Semmelweis had addressed two further Open Letters to Professor Siebold of Göttingen and Professor Scanzoni of Würzburg [28]. "In the two letters published in our periodical Prof. Semmelweis defends his aetiology of the puerperal fever against two colleagues who have misinterpreted his doctrine, calling finally upon Professor Siebold to arrange a meeting of German obstetricians somewhere in Germany to discuss the question of puerperal fever. He professed readiness to stay there 'until all have been converted to his theory'."

The second letter to Scanzoni was again provoked by an article from Franqué who discussed a new puerperal epidemic in the Obstetric Clinic of Würzburg in 1860. Semmelweis was naturally shocked to read that Scanzoni was satisfied

with the aetiological role of atmospheric influences and failed to consider the cause of the infection as being decomposed organic material.

"Herr Hofrath has been in the right for 13 years", says Semmelweis, "because I have been silent for 13 years. Now I have broken this silence and I am in the right, and I shall remain so as long as the human female continues to bear children. To you Herr Hofrath, nothing remains but to accept my doctrine, if you wish to save your reputation, or at least as much of it as remains to save . . .

"If you continue to adhere to the doctrine of epidemic puerperal fever, then, as knowledge advances, with your pseudo-epidemics also your reputation will disappear from the world.

"You have demonstrated, Herr Hofrath, that in a new hospital like yours provided with the most modern furnishings and appliances, a good deal of homicide can be committed, where the required talent exists."

In May 1861, in a German obstetrical journal an article appeared from the pen of Prof. Siebold on the subject of puerperal fever, in which he attacked the Semmelweis doctrine. "Semmelweis discovered in 1847 the theory of cadaveric infection", writes Siebold, "as the chief cause, or rather the only cause of puerperal fever epidemics. He maintains that cadaveric particles which, after dissections presumably stick to the fingers, or even the odour which may persist even after a soapy handwash, both retain the quality of conveying, during an internal examination of the lying-in patient, puerperal processes . . . This should suffice: on the theory of cadaveric infection judgement has already been pronounced!"

Siebold did not agree with Semmelweis's theory of cadaveric infection, but in a note to the above statement he adds: "I fully endorse, however, what Lehmann professes concerning the possibility of such infection, especially if the circumstances are similar to those found by Semmelweis in Vienna, where the cadaveric poison was brought straight from the dissection room and transmitted by infected fingers to the parturient, etc. In such cases certainly caution should be exercised, and here the chlorine handwash recommended and practised by Semmelweis may sometimes be applied. In this connection Semmelweis again raises his voice in his recent writing. However he attacks everybody who will not share his views, or raises the slightest doubts so brutally that we cannot but commiserate his attitude, stressing, at the same time, that fundamentally he was right, and particularly his theory had great practical value for Vienna, which should never be forgotten" [29, 30].

Even in the eyes of the excellent Siebold, Semmelweis was considered to be the apostle of "cadaveric infection".

Semmelweis gave public expression of his displeasure, though his letter is pervaded by a feeling of respect and friendship for Siebold.

"Herr Hofrath has made himself responsible for the diffusion of errors regarding puerperal fever by the publication of an article which appeared in May 1861", wrote Semmelweis to Siebold. ". . . I remember with pleasure the time we spent together in Pest, pleasant memories are associated in my mind with you, Herr Hofrath, but the groans of puerperal women dying in childbed fever drown

the voice of my heart, and my reason commands me to fight for the truth, even though my heart is thereby painfully touched . . .

"Ever since the time that women have borne children, puerperal fever has developed in the majority of cases through infection by deleterious materials conveyed from outside . . .

"You teachings, Herr Hofrath, must necessarily result in the slaughter of lying-in women, and as I have made the firm resolution to make an end to these practices, I cannot help but oppose your murderous errors!

"Herr Hofrath, you maintain that under the chairmanship of M. Orfila, the Medical Academy of Paris rejected my teachings. You, Herr Hofrath, seriously believe that both Orfila and the Academy are such great authorities that it would be useless to find other arguments for the rejection of my doctrine.

"You can take it from me, Herr Hofrath, that Paris is not too great an authority. Discussions at the Medical Academy of Paris lasting for four solid months on the subject of puerperal fever in 1858, i.e. 11 years after 1847, have convinced me that the French physicians would do better by coming to Pest to take lessons in puerperal fever . . .

"If you, Herr Hofrath, in spite of everything, thrust upon me a teaching professing that all cases of puerperal fever are produced by cadaveric infection, that amounts to wilful misrepresentation, or lack of the ability to understand it. . . . But because I do not consider it being that, I protest most energetically against the misrepresentations of my doctrine by the expression 'cadaveric infection' . . . Herr Hofrath, I know you to be a man of an extremely kind disposition, and I am convinced that it is not possible for you to do intentionally a thing disagreeable to any man. I cannot reconcile it with your nature that simply because your information concerning the causation and prevention of puerperal fever is insufficient you can tolerate that lying-in women should be massacred out of sheer ignorance . . . I beg you, Herr Hofrath, to acquire an intimate knowledge of the truth as it is set forth in my book, so that in accordance with your kind disposition, you will be able to find support for new opinions in the bright faces of your lying-in patients and in an empty mortuary . . .

"Herr Hofrath has read my book with so little understanding . . . and I am afraid that you are not the only one who profited so little by its perusal. Yet I maintain that I am in dead earnest in my resolution to rid mankind of the scourge of puerperal fever, therefore I put before you a noble proposal to the effect: Would you, Herr Hofrath, arrange for a meeting of German obstetricians in the month of August or September in some German city depending entirely upon your choice, to debate the question. I myself would naturally be present . . .

"I am determined to stay there until I have succeeded in converting all participants to my opinion. — Herr Hofrath, the groaning of the dying puerperae is stifling the voice of my heart while I am writing . . ."

Siebold, who had not forgotten his former friendship with Semmelweis, did not take this to heart and soon after the publication of the Open Letter made the following statement: "I do not wish to bear grudge to my friend Semmelweis,

who wants to scorch me with the rays of the very puerperal sun (as he expressed himself in his Open Letter), which has risen over him, for the simple reason that I am not ready to share his views on puerperal fever unconditionally" [31].

Siebold died soon after, in October 1861, and the meeting of Semmelweis with the German physicians never took place. A Conference of German Physicians and Natural Scientists did meet in Speyer on September 19th, 1861 to discuss the treatment of puerperal fever. Semmelweis was not present. No one knows why, or whether he was invited at all?

A single speaker at the conference sided with Semmelweis. It was Wilhelm Lange, Professor of Obstetrics at Heidelberg [32]. All the others at the conference attacked Semmelweis and his doctrine. Karl Hecker maintained that the question of the periodical outbreak of puerperal fever could not be solved by the infection theory. Otto Spiegelberg again declared that puerperal fever could accompany carditis and pleuritis without affecting locally the genital organs. Wilhelm Roser (1817–1888), surgeon of Marburg, said that pyaemia was a specific disease like typhus for example. J. W. Betschler (Breslau) believed that each variant of puerperal fever had its specific aetiology, while Arnoldi insisted that it was the result of dermatological troubles, and only in rare instances could the cause of the infection be cadaveric [33].

At the meeting of the gynaecological section, Virchow did not support the Semmelweis doctrine either, professing that the disease has different forms and different aetiologies and should be discussed accordingly in groups. He admitted that one variety of puerperal fever might be caused by local infection but that it did not exclude the existence of the puerperal epidemic [34].

Markusovszky also reacted to the various contributions of the meeting in Speyer and in the *Medical Weekly* published a special article in 1862, answering all the attacks against Semmelweis, one by one, from Hecker to Virchow [35].

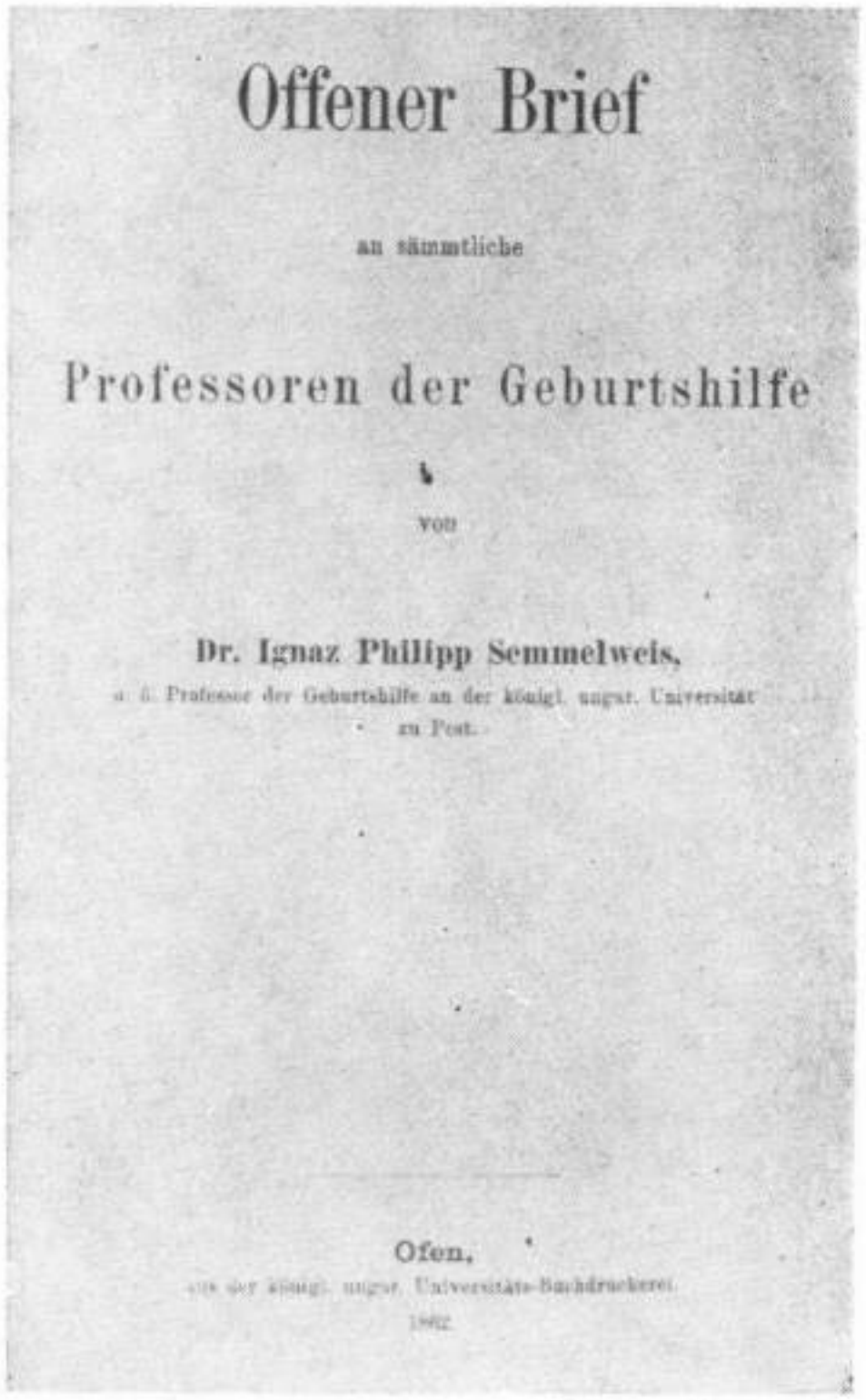
After the Speyer conference Semmelweis seized his pen again, writing this time an Open Letter, addressed to all professors of midwifery [36].

The editor of the *Medical Weekly*, when sending the 92 pages of the Open Letter to its subscribers as a supplement to its No. 30, 1862, enclosed the following note: "Herewith we are submitting the latest contribution of Professor Ignác F. Semmelweis who has not relinquished his efforts in the interest of afflicted women. It is entitled: *Offener Brief an Sämtliche Professoren der Geburtshilfe* and is included in our present number. The author is delivering a smashing blow to his opponents in the question of puerperal fever, proving by infallible statistics and multiple arguments the truth of his theory. The victory of a good cause may be retarded, especially when delusions have to be defeated, but the final triumph is assured. We feel confident that the time will come when our author will be given full satisfaction, which cannot be anything else but the complete recognition of his doctrine."

In this Open Letter Semmelweis again summarizes the contents of his book, arguing with his opponents, rebuking with scathing irony Scanzoni, Braun, Patruban and other obstetricians.

"Scanzoni", writes Semmelweis, "has shared in the crime of the majority of the obstetricians responsible for the murder of lying-in women and their unborn infants, who fifteen years after my discovery have still not taught their students, accordingly, that puerperal fever, which attacks labouring women through external infection and develops into an absorption fever, can be prevented."

He concludes his Open Letter with these words: "If the professors of obstetrics do not, by instructing their students and midwife pupils within the shortest possible time, comply with my doctrine, and if the governments continue tolerating puerperal epidemics in their lying-in hospitals, then I will turn to the helpless public directly, and persuade them to prevent either physicians or midwives from coming into contact with the lying-in woman before they have washed their hands slippery, hoping that the public will be easier to instruct than the university professors...


Offener Brief

an sämmtliche

Professoren der Geburtshilfe

von

Dr. Ignaz Philipp Semmelweis,

o. ö. Professor der Geburtshilfe an der königl. ungar. Universität zu Pest.

Ofen,

1861

Title page of the Open Letter to all professors of obstetrics

My doctrine has not been advanced so that the book expounding it should mould away in the dust of a library: My doctrine has a mission, which is to bring blessings to the practice of everyday life . . . to banish terror from the lying-in hospitals, to preserve the wife to the husband, the mother to the child."

This Open Letter, addressed to all professors of obstetrics, carries also the text of those letters which Semmelweis had received after the publication of the Open Letters from those people who approved his teachings. He must have been very pleased with the letter of J. A. J. Pippinsköld (1825–1892), Professor of Obstetrics and Paediatry in Helsingfors, informing him that the teaching of Semmelweis had been borne out by his own experiences. He received letters with similar contents from K. A. Pernice (1829–1899), professor in Greifswald, G. Veit (1824–1903), professor in Bonn and Kugelmann (1828–1902), practitioner of Hannover.

Kugelmann, a former student of Michaelis, had sent Semmelweis letters of encouragement and recognition on two occasions [37]. In his first letter, dated July 18th, 1861, he exhorts Semmelweis to have patience with Siebold who,

between 1851 and 1854, had several times spoken highly of his discovery. In his second letter, dated August 10th, 1861, he expressed his admiration as follows: "Only a few men have been so fortunate as to render great services to mankind, and—save a few exceptions—the world either crucified them or burnt them on the stake. I sincerely hope that you, in the struggle in store for you, will not lose patience. Victory cannot be long in coming, because many of your literary adversaries have *de facto* become the propagators of your teachings" [38].

In the letter addressed to all the professors of obstetrics, Semmelweis promised to continue it, but the closing part never appeared in print.

It is a natural question to ask oneself, why in fact had Semmelweis written these "notorious" letters?

He himself hastens to answer our question, when he says: ". . . the groaning of the women dying of puerperal fever is louder than the beating of my heart, and my mind compels me to justify my case however grievous it should be to my heart . . . There is no other course open to me but to put an end to the murderous practices of my adversaries by exposing them most ruthlessly: nobody with a feeling heart will take it amiss but will understand that there is no other course open to me" [39].

It was not a desperate action from the part of Semmelweis to write these letters. He considered it inevitable if he wanted to save mankind from the dreadful calamity, when thousands of women were dying unnecessarily day after day. It was bitter for him to see the solution to the centuries-old mystery lying in his hands and yet he could not prevent the massacre because of the ignorance, vanity and indifference of the leading obstetricians and academic authorities.

In the Open Letters it was not himself he thought of. He fought only for the mothers, and he was firmly convinced that if his theory was not disregarded, they would survive—his personal vanity never entered into consideration. Semmelweis was in dispair because, owing to indifference, countless mothers and babies were dying in the hospitals when all the physician had to do was to wash their hands according to his instructions. Or when they did wash their hands, they denied it, in order to prevent the propagation of his doctrine. He was a man who hated deceit. He preferred to tell the truth, whatever the consequences, so there was no other course open to him than to defy the greatest men in his profession.

Yet the Open Letters neither helped Semmelweis, nor did they make it easier for the doctrine to be accepted. Nevertheless, they shocked the medical world to the extent that the question of puerperal fever could not be dismissed any longer.

Few of Semmelweis biographers have misunderstood the purport of the Open Letters, or even their usefulness in the desperate fight for the lives of mothers. Posterity did not misinterpret the reckless tone of the Open Letters, because the writer's indignation was justified in face of the responsibility he felt. J. Grosse maintains that the open letters did not miss their aim, especially the one addressed to all the obstetricians, in bringing home to all concerned the possibility of

prevention in puerperal fever [40]. J. B. Brennecke also clearly says in 1879 that nowhere else was the significance of prophylactic measures in puerperal fever more emphatically put forward than in Semmelweis's Open Letter addressed to all obstetric professors [41]. There were very many who objected to the offensive tone of the Open Letters. Even among the personal friends of Semmelweis there were some who felt that the controversial attitude adopted by him did not help the cause. As Fleischer put it, "his desperate measures and his animosity by no means led to success". J. Ambró in his article, "The Lying-in-Hospitals and Professor Semmelweis's Doctrine", says: "His wounded sensibility and his animosity hardly helped matters, yet his noble efforts in fighting for his cause must be appreciated and he must be excused because his motives were honorable, in his dispair to make his incontestible doctrine accepted by authoritative men" [42].

We do not intend to waste much space on the views of later writers who maintain that the Open Letters mark the initial stages of his mental deterioration [43]. It is absolutely wrong to work backwards and to link his mental state in 1861–62 with the acute mental illness immediately preceding his death. It seems almost futile to refute a false argument by insisting on the fact that for many years after the publication of the Open Letters he was perfectly sane, engaged in high-level scientific, social and professional activities, to the complete satisfaction of his colleagues, patients and the whole university. Suffice it here to refer to the Open Letter addressed to Professor Siebold, with its deeply moving humane tone, original ideas, and perspicacity, which proves that the writer was not only a righteous man but an exceptional personality, unique in its kind in medical history.

The biographer who knows all the details of Semmelweis's struggles must necessarily sympathize with his desperate efforts in trying to save thousands of lives. He must bow to the courage of a man who dared defy the greatest authorities of his time.

Before the appearance of his last Open Letter, Semmelweis wrote a letter to the editors of the *London Medical Times and Gazette*, which published it in full. It was entitled, "On the Origin and Prevention of Puerperal Fever. A Letter from Dr. Semmelweis" [44]. The periodical had referred in its number of February 8th, 1862 to an article written by Karl Hecker in the *Aerztliches Intelligenz Blatt*, where the author dealt with the outbreak of puerperal fever in the Obstetric Clinic in Munich in 1860, and a repeated epidemic outbreak in 1861. In his article Semmelweis contested certain statements in Hecker's paper but also repeated the main points of his doctrine.

The *Index Catalogue* published in Washington reproduced the main points of Semmelweis's statement. The general error according to which Semmelweis's *Aetiology* had appeared in English in 1862 must be due to the Washington reference [45].

Semmelweis's great book, which could not convince the contemporary authorities of his time, met with the greatest recognition in posterity.

H. Fritsch stated in 1884 that it had still the same fresh appeal on the reader: "Who could resist the tremendous impact of the book? Some of its arguments could stand in the most up-to-date work" [46].

A. Hegar insists that by means of his statistical methods Semmelweis never failed to prove his point [47]. The same is corroborated by R. Hardegen who maintains that Semmelweis's statistical proofs and logical arguments had not ceased to be valid twenty years after the publication of the book [48]. W. C Danforth considered it the most significant event in medical history, and he said that it was mainly due to the "superfluous" statistical tables and its bad style that the book did not exercise a greater influence [49]. P. Dawson also criticizes the clumsy style of the book, which, according to him, is responsible for the fact that even ten years after its publication arguments could be raised against him that Semmelweis refuted in this very book [50]. W. J. Sinclair also bewails its bad style: "If Semmelweis could have written like Holmes, his *Aetiologie* would have conquered Europe in twelve months".

Schürer von Waldheim writes in his Semmelweis biography: "Semmelweis developed his teaching very clearly, in classic, lucid terms, up to the last statement. It was due to his book and the Open Letters that finally his doctrine triumphed" [51].

The *Aetiology* does not merely mark the climax of the medical activities of Semmelweis, but it is regarded today as one of the most significant works in medical literature.

G. Stricker, the famous historian, expressed the opinion of the modern scientific world when he says: "Owing to the truth contained in its subject and the clarity of its expression, it (the book) ranks with the classics of medical literature, in line with Robert Koch's *Investigations on the Aetiology of Wound-Infection* and Pasteur's *Chicken Cholera* [52].

Semmelweis's great book appeared in English in the American series *Medical Classics* in 1941 [53]. In his introduction the translator is responsible for a curious confusion of established facts: He mixes up the Semmelweis doctrine with the contagionist view, and gives the honour of priority to Holmes, maintaining that Semmelweis had not known about the former's work.

Notes

1. Correspondence and Opinions in the Literature for and against my Doctrine. Semmelweis, op. cit. pp. 185–286.
2. In the May number of *Medical Weekly* appeared another Notice: "On May 16th of the meeting of the Medical Society of Pest–Buda, Professor Semmelweis delivered the final

part of his paper on the aetiology of puerperal fever with the warm, intimate tone of independent scientific conviction." Cf. *OH* (1858) p. 320.

3. "Abstract of a very interesting communication in the November number of the Orvosi Hetilap by dr. Semmelweis, Professor at the University of Pest, treating upon Puerperal Fever. *Indian Lancet* (*Lahore*) (1860) pp. 35–36.
4. A gyermekágyi láz fölötti véleménykülönbség köztem és az angol orvosok között (Where I disagree with the English physicians). *OH* (1860); pp. 44–47. Semmelweis, op. cit. pp. 68–69.
5. *Die Aetiologie, der Begriff und die Prophylaxis des Kindbettfiebers.* (Pest–Wien–Leipzig, 1861). Verlag K. A. Hartleben. Translated into Hungarian by T. Györy, and published in Complete Works of Semmelweis. The book was printed by the publishing company of Konrad Adolf Hartleben of Mainz (1778–1863), established in 1803. Hartleben left Pest for Vienna in 1844 but retained his firm in Pest until 1863–66. Cf. A. Gárdonyi, Régi pesti könyvkereskedők (Old Booksellers of Pest). *Magyar Könyvszemle* (*Hungarian Book-Review*) (1925–1929); J. Waldapfel, *50 év Buda és Pest irodalmi életéből* (*Fifty Years of Literary Life of Pest and Buda*). (Budapest, 1935).
6. In his memorial speech in 1907, Tauffer emphasized that ". . . with the discovery of self-infection, Semmelweis even detected those rare cases where the 'decomposed' material was produced by the organism itself. Cf. *Gynäkologie* (1907) pp. 55–58. At the beginning of our century the right interpretation of self-infection was still a highly debatable question. At the time of the debate the concept of self-infection was recognized by F. Ahlfeld (1843–1929), Professor of Obstetrics in Marburg and L. Aschoff (1886–1942), Professor of Morbid Anatomy in Freiburg University. Cf. *Deutsche Med. Wschr.* (1911). J. K. H. Fehling (1847–1925), Professor of Obstetrics in Strasbourg, had only recognized its historic importance. Cf. *Zbl. Gyn.* (1911) p. 857.
7. Semmelweis, op. cit. p. 287.
8. O. Pertik: *In memoriam Semmelweis.* Toast at the Semmelweis evening of the Medical Casino, Budapest, January 24th, 1911 (Budapest, 1911).
9. L. Markusovszky, Semmelweis tanár gyermekágyi lázról írt munkájának ismertetése (Review of Professor Semmelweis's Book on Puerperal Fever). *OH* (1861) pp. 184–186, 225–228, 260–270.
10. F. Földváry, Semmelweis tanár könyvének ismertetése (Review of Prof. Semmelweis's Book). *Gyógyászat* (*Medical Practice*) (1861) pp. 10–11. J. Fleischer, Semmelweis tanárnak a gyermekágyi láz felőli tana (The Doctrine of Prof. Semmelweis on Puerperal Fever). ibid. (1861) pp. 400–406.
11. Cf. J. Antall, *Communicationes de Historia Artis Medicinae*, vol. 46; also in: *The Journal of Obst. and Gyn. of the British Empire*, vol. XV (January to June 1909), p. 254.
12. C. S. F. Credé, in his *Gesunde und Kranke Wöchnerinnen.* (Leipzig, 1886), recognized the Semmelweis doctrine. We have referred to: *Monatsschrift für Geburtskunde und Frauenkrankheiten* (1861) pp. 406–407.
13. ". . . *dem Verfasser jedenfalls, da ihm übrigens das schon lange allseitig zugesprochene Verdienst gebührt . . .*".
14. R. Froriep (1804–1861), German pathologist.
15. *OH* (1861) p. 26.
16. F. Zipfl, Die Puerperalfieber-Epidemie an der zweiten Geburtsklinik in Wien, *Österr. Zeitschrift für praktische Heilkunde* (1961) pp. 871–875.
17. ". . . *zum Verständniss der eigentlichen Wochenbettkrankheiten haben Buhl, Martin, Klaproth, Wagner und Förster einen wesentlichen Beitrag geliefert durch Bestimmung des Verhältnisses der Salpingitis zur Peritonitis.*" Cf. Berichte über die Leistungen auf dem gesamten Gebiete der Heilkunde. *Medizinische Jahrbücher* (1861) p. 229.
18. Kleinwächter (Czernovicz), Erinnerungen an August Breisky, *Janus* (*Amsterdam*) (1904) pp. 433–442, 488–498.
19. *OH* (1861) pp. 533–534.

20. ". . . The impressive article of Markusovszky written in the Hungarian language remained unknown to Western Europe for many years until it was translated by Bruck." Cf. W. Sinclair, *Semmelweis. His Life and his Doctrine.* (Manchester, 1909) p. 235.
21. "*Wir können nur bewundert die Ausführungen M. folgen und müssen auch heute noch eingestehen, dass dieses Programm von M. keineswegs vollständige Erfüllung gefunden hat.*" Cf. J. Fischer, Von Semmelweis zur modernen Asepsis. *Wiener Med. Wschr.* (1918) p. 26.
22. V. Tauffer: Memorial speech on 100 years' anniversary of birth of Semmelweis at a Special Meeting of the Budapest Royal Medical Society Oct. 12th, 1918. Cf. *OH* (1918) p. 41.
23. "*Alle Achtung vor diesem weitblickenden Gelehrten, der die Grenzen der Semmelweis'schen Entdeckung mit solcher Klarheit schaute, und mit solcher Schärfe auf jenen Punkt wies, wo weitergeforscht werden muss. Schade, dass Markusovszky seine Gedanken nur in ungarischer Sprache veröffentlichte! Sie verdienten in aller Kultursprachen der Erde verkündet zu werden und hätten zweifellos da und dort befruchtend gewirkt.*" Cf. Schürer von Waldheim, op. cit. p. 184.
24. Memorial speech made by T. Győry at the Semmelweis Memorial Meeting of the Medical Society, Sept. 9th, 1906. Cf. *Yearbook of Budapest Royal Medical Society.* (Budapest, 1906) p. 45.
25. Semmelweis, op. cit. p. 287.
26. *Zwei offene Briefe an Dr. J. Spaeth, Professor der Geburtshilfe an der k. k. Josefs-Akademie in Wien, und an Hofrath Dr. F. W. Scanzoni, Professor der Geburtshilfe zu Würzburg.* (Pest, 1861). Published in T. Győry's translation into Hungarian in *Complete Works* of Semmelweis (pp. 499–508).
27. O. Franqué (1833—1879), assistant to Scanzoni, later Professor of Midwifery in Prague University, Die puerperalen Erkrankungen in der Entbindungsanstalt zu Würzburg während der Monate Februar, März, April, 1859; *Beitr. zur Geburtskunde und Gynäkologie* (Würzburg, 1860) pp. 238–249.
28. *Zwei offene Briefe an Hofrath Dr. Eduard Caspar Jacob von Siebold, Professor der Geburtshilfe zu Göttingen und an Hofrath Dr. F. W. Scanzoni, Professor der Geburtshilfe zu Würzburg.* (Ofen, 1861); Semmelweis, op. cit. pp. 513–537.
29. "*Semmelweis sprach im Jahre 1847. die Theorie der Leicheninfektion als Hauptursache, ja sogar als einzige Ursache der Puerperal-Epidemien aus. Nach ihm behalten die Leichen Molecüle, welche nach Sectionen oder Übungen an Cadaver an den Fingern haften bleiben, ja selbst der Leichengeruch, der selbst nach Waschungen mit Seifenwasser zurückbleiben, die Eigenschaft der Puerperalprozesse bei nachher vorgenommenen inneren Untersuchungen während der Geburt einzuimpfen . . . Genug, über die Theorie der Leicheninfektion ist gegenwärtig das Urteil gesprochen!*"—"*Wir unterschreiben aber vollkommen, dass Lehmann in dem Folgenden über die Möglichkeit einer solchen Infection angibt, zumal wenn solche Verhältnisse obwalten, wie sie Semmelweis von Wien aus gemeldet hat, dass aus dem dortigen Leichenhaus das Leichengift unmittelbar durch Untersuchung mit unreinen Händen auf Gebärende usw. übertragen wurde. Es kann hier nicht Vorsicht genug empfohlen werden, und es sind dafür die von Semmelweis angerathenen und geübten Waschungen mit Chlorkalklösung in individuellen Fällen gewiss an ihrer Stelle. Semmelweis hat über diesen Gegenstand in einer eben erschienen Schrift ("Die Aetiologie usw.", Pest, Wien, Leipzig, 1861.) noch einmal zu Gunsten seiner Ansicht das Wort ergriffen, ist aber dabei in so maasloser Weise gegen Alle die nicht seiner Meinung sind oder auch nur Zweifel über dieselbe zu äussern wagten, zu Felde gezogen, dass wir solche nur aufrichtig bedauern können, da die Sache selbst einen guten Kern hat, für Wien namentlich von grosser praktischer Bedeutung war und nirgend vergessen werden sollte.*" Cf. *Monatsschrift Geburtskunde und Frauenkrankheiten,* May, 1861.
30. Betrachtungen über das Puerperalfieber. Nach Lehmanns Rapports de la commission d'obstétrique. *Communiqués au cercle médical d'Amsterdam.*
31. ". . . *und daher auch dem Freunde Semmelweis gerne verzeihe, dass er mich vor kurzem, nach dem ihm die puerperale Sonne aufgegangen, wie er sich ausdrückte in einem offenen*

Briefe, mit eben diesen Strahlen verbrennen wollte, weil ich mich nicht unbedingt seinen Ansichten über das Kindbettfieber und dessen Verhütung zugewendet habe." Cf. *Geburtshilfliche Briefe.* (Braunschweig, 1862) pp. 74–80.

32. Lange in his handbook on midwifery does not even mention the name of Semmelweis. *Lehrbuch der Geburtshilfe mit Berücksichtigung der gerichtsärztlichen Seiten des Faches.* (Erlangen, 1868).
33. 36. Versammlung deutscher Naturforscher und Aerzte in Speyer im Jahre 1861. Verhandlungen der Section für Gynäkologie. *Monatsschrift für Geburtskunde und Frauenkrankheiten* (1861) pp. 406–407. In the *Medical Weekly* Markusovszky also contributes an article on the view of Lange, Hecker, Spiegelberg, Roser, Betschler, Arnoldi and Virchow. Cf. *OH* (1861) pp. 533–535.
34. Karl Sudhoff, Librarian of the Society of German Physicians and Natural Scientists, on the 100 years' anniversary of the meetings published with notes and commentaries Virchow's lectures on the occasion: *Rudolf Virchow und die Deutschen Naturforscherversammlungen.* (Leipzig, 1922). It does not include Virchow's speech at the Speyer meeting attacking the Semmelweis doctrine. Sudhoff had evidently not thought it fit to be published.
35. Markusovszky, L.: A külföldi sajtó nyilatkozatai Semmelweis tana felett a gyermekágyi láz okairól (Foreign Reactions to the Semmelweis Doctrine on Puerperal Fever). *OH* (1862) pp. 117–119.
36. *Offener Brief an sämmtliche Professoren der Geburtshilfe.* (Ofen, 1862); Semmelweis, op. cit. p. 565.
37. Semmelweis quotes the letter in full in his *Open Letter to All Professors of Obstetrics.* Kugelmann had sent him Jenner's book (*An Inquiry into the causes and effects of the variolae vaccinae*), the same copy which had been given to J. F. Blumenbach (1752–1840), Professor of Anatomy and Anthropology in Göttingen. It is worth recording that Kugelmann in his second letter to Semmelweis quoted Heine, and consoles him by saying: "... when Pythagoras discovered his famous theory he sacrified hundred oxen. Ever since oxen have been scared of the truth." Cf. F. Boenheim, *Virchow, Werk und Wirkung.* (Berlin, 1958). Boenheim (1891–1960) was director of the Institute for Medical History in Leipzig. Karl Marx, in a letter to Kugelmann, also refers to Semmelweis as an outstanding representative of medicine. Cf. L. Farkas, *Haeckel és Virchow* (*Haeckel and Virchow*). (Budapest, 1961). It is evident that the fame of Semmelweis had travelled far, and his political and social impact was also appreciated.
38. "*Nur sehr Wenigen war es vergönnt, der Menschheit wirkliche, grosse und dauernde Dienste zu erweisen, und mit wenigen Ausnahmen hat die Welt ihre Wohltäter gekreuzigt und verbrannt. Ich hoffe deshalb, Sie werden in dem ehrenvollen Kampfe nicht ermüden, der Ihnen noch übrig bleibt. Ein baldiger Sieg kann Ihnen um so weniger fehlen, als viele Ihrer literarischen Gegner sich de facto schon zu Ihrer Lehre bekennen.*"
39. Semmelweis, op. cit. pp. 500, 513.
40. J. Grosse, *Die offenen Briefe an Professoren der Geburtshilfe von I. Ph. Semmelweis.* (Dresden, 1899).
41. J. B. Brennecke (1849–1931), obstetrician in Magdeburg, Das Puerperalfieber, seine Prophylaxis und Therapie. *Berliner Klin. Wschr.* (1879) pp. 744–747.
42. J. Ambró (1827–1889), *OH* (1870) pp. 17–19.
43. E. Ebstein, *Aerzte-Briefe aus vier Jahrhunderten* (Berlin, 1920); C. J. Venrell, Acotationes a la vida y personalidad de Semmelweis. *Revista Española de Obsterticia y Ginecologia*, vol. 9 (Madrid, 1950), pp. 389–401; M. Zeissl, Erinnerungen aus der Semmelweiszeit. *Wiener Med. Wschr.* (1918) pp. 1205–1206. Ebstein maintains that the Open Letters point to the first stages of insanity. Venrell shares this view, but he welcomes the Open Letters because they focus attention on a new concept of puerperal fever. Zeissl considers the statement "A Hungarian midwife knows more about puerperal fever than Virchow" shows signs of mental disorder.
44. *The London Medical Times and Gazette* (1862) pp. 601–602.

45. *Washington Index Catalogue* (1890) vol. XI, p. 821. It was due to the reference in this publication that it was thought that Semmelweis's book had appeared in English in 1862. Cf. I. Dolmány, *Semmelweis küzdelmes élete* (*Semmelweis, the Trials of his Life*). (Budapest, 1958), on p. 60 we read that Semmelweis's book appeared at the same time in German and in English, which is naturally wrong.
46. "*Wer könnte sich des gewaltigen Eindruckes seines Buches verschliessen? Noch heute könnten ganze Seiten seiner Deductionen in der modernsten Arbeit stehen.*" Cf. H. Fritsch, *Grundzüge der Pathologie und Therapie des Wochenbettes.* (Stuttgart, 1884).
47. A. Hegar, Fünfzig Jahre Geburtshilfe. *Therapie der Gegenwart* (1909) pp. 41–51.
48. R. Hardegen, Semmelweis. A Biographical Sketch. *Amer. J. Obst. and Dis. of Women and Children* (1885) pp. 54–55.
49. William C. Danforth, Professor of Obstetrics, North Western University (USA), The Beginnings of Asepsis. The Story of a Tragic Life. *Proceedings of the Institute of Medicine, Chicago* (1945) vol. 15, p. 425.
50. P. Dawson, Semmelweis: An Interpretation. *Annals of Medical History* (*New York*), (1924) p. 258.
51. "*Semmelweis selbst hat seine Lehre mit genügender Deutlichkeit, ja klassischer Klarheit dargelegt und bis an die letzten Konsequenzen verfolgt. Der Lehre zum Siege verholfen hat nur Semmelweis selbst mit seiner Aetiologie und seinen offenen Briefen.*" Cf. Schürer von Waldheim, op. cit. p. 235.
52. "*Sie (die Schrift) gehört wegen der Wahrhaftigkeit des Inhaltes und der Klarheit der Darstellung zu den besten Erziehungsschriften des Arztes, und ist dem Büchlein Robert Kochs: 'Untersuchungen über die Aetiologie der Wundinfektionskrankheiten' und den Mitteilungen Pasteurs 'Über die Hühnercholera' an die Seite zu stellen.*" Georg Sticker (1860–1960), German medical historian, cf. *Louis Pasteur: Die Hühnercholera, ihr Erreger, ihr Schutzimpfstoff (1880)*. translation and introduction by G. Sticker (Leipzig, 1923).
53. *The Etiology, the Concept and the Prophylaxis of Childbed Fever* (*Pest, Vienna, Leipzig. S. A. Hartleben Verlag-Expedition, 1861*). Translated by Frank Peter Murphy, M.D., Associate Professor of Obstetrics, Creighton University School of Medicine. *Medical Classics*, vol. 5, nos 5–8, pp. 338–776 (Baltimore, 1941) Williams–Wilkins.

Chapter Six

Resistance to Accept the Doctrine

The united front of European obstetricians against the Semmelweis doctrine — Instinctive reaction to new ideas — The Semmelweis doctrine versus the anatomical concept — Professional jealousy of colleagues — Distorted views — Semmelweis's unique personality — Unfavourable atmosphere in an oppressed country — Weakening resistance to the teachings of Semmelweis's doctrine — "There is no serious obstetrician any more who would oppose the Semmelweis doctrine" — Semmelweis's personal enemies: Karl Braun and Scanzoni — Virchow and Semmelweis

The United Front of European Obstetricians against the Semmelweis Doctrine

Semmelweis was quite sure that the truth of his doctrine would sooner or later convince everybody. For years he had kept silent and when his book appeared in 1861 he was almost forgotten.

It was because of his silence that most of the information concerning his teaching had been received second-hand, from references in the works of his opponents, and no one, not even himself, had stood up against them, or their errors. For long years his doctrine had been interpreted as referring only to "cadaveric poisoning", and as such, resistance to it had gained in momentum.

His success in the Medical Society of Vienna was a mere episode of the past. Soon after the debate in the Medical Society the leading obstetricians in Europe, such as Kiwisch, Scanzoni, Siebold, Martin and many others had expressed their views on the subject, each speaking against the theory of Semmelweis.

Franz Kiwisch von Rotterau was among the first obstetricians to oppose it. Between 1842 and 1845 he had reported on the achievements of the English physicians in their fight against puerperal fever in the columns of *Canstatt's Jahresberichte*, while either belittling their efforts, or else leaving them without comment. He had even called on Semmelweis in 1848 and 1849, yet in his article in the periodical of the Medical Society of Vienna, entitled "A Few Words about the Discovery of Semmelweis on the Origin of Puerperal Fever as Discussed by Prof. Skoda", he maintained that Skoda had been wrong and that there was nothing new in Semmelweis's discovery. Kiwish rejected the view that decomposed organic material could in fact be infectious, since no one had so far proved it effectively. He insisted that in the aetiology of puerperal fever atmospherical influences should be considered as the most potent causal factors, with due consideration to local conditions. Puerperal fever—he wrote—had existed, with epidemic outbreaks as well, long before post mortem examinations had ever been performed.

This highly respected obstetrician, who also opposed the views of the contagionists, was not ashamed to write that he had never witnessed any disastrous

effects on lying-in patients examined by students of his who had been previously engaged in post mortem examinations. In his lying-in hospital—he wrote—pregnant and parturient women had been examined by large numbers of medical students without reference to whether they had been previously in the dissecting room or not.

Kiwisch obstinately maintained that the outbreak of puerperal epidemic in 1846 in his hospital was due to accidents, although from a total of 102 lying-in patients 33 were taken ill and 27 died of puerperal fever. These "accidental cases" were, to his mind, the result of atmospheric changes in the weather! [1].

The same view was repeated in his book, entitled, *Clinical Lectures on the Specific Pathology and Therapy of the Female Sex* [2], which appeared in several editions. Hegar deplored Kiwisch's view, saying in 1882, ". . . this was written by the same man who, in his clinic in Würzburg, had lost 26 per cent of his patients in one year. If there had not been so many similar instances of human error, one would wonder how such a prominent, experienced teacher of midwifery could be so blind and biassed" [3].

At the time Semmelweis had not made any comments, but later in his classic work he had the following to say about Kiwisch: "I do not wish to deny that English doctors had discovered before me that decomposed animal material could produce puerperal fever. Yet there is an important difference between my opinion and that of the medical profession in England concerning the origin of puerperal fever: I have explained at great length on pp. 210–230 of my book that English physicians restricted their observations to a narrow field only . . . Nevertheless, had Kiwish discovered the truth of these observations, he would have inadvertently expressed his thanks to God that at long last the female sex had been delivered of its greatest scourge" [4].

Semmelweis was not at all astonished when the Medical Academy of Paris attacked his doctrine in 1851. Franz H. Arneth, a former colleague of his in the 2nd Obstetric Clinic of Vienna, started on a long tour in Europe in December 1850, to study the various obstetric hospitals. He delivered a lecture before the Medical Academy of Paris on January 7th, 1851 and declared that "with the prophylactic method recommended by Semmelweis it had been possible to stop the spread of the puerperal epidemic in the obstetric hospitals of Vienna" [5].

Soon after the lecture, it was announced in No. 3, 1851 of the *Gazette des Hôpitaux Civils et Militaires (La Lancette Française)* that a commission had been sent out headed by Professor Matheo Jose Bonaventura Orfila (1787–1853) to investigate the matter on behalf of the Medical Academy. The commission immediately pronounced a decision against the "theory of cadaveric infection", expressing positive disbelief that any chlorine solution could destroy cadaveric poison.

In May 1851 Arneth continued his journey and in the same month read a paper before the Medico-Surgical Society of Edinburgh entitled: "Evidence that Puerperal Fever depends on the Contagious Inoculation of Morbid Matter". This address containing a splendid exposition of the Semmelweis doctrine was

published as an article in the June number of the *Monthly Journal of Medical Science* (1851) and was well received in Britain [6]. This was an exceptional case as the Semmelweis doctrine had aroused only hostility everywhere in Europe.



Wilhelm Scanzoni

Wilhelm Heinrich Busch (1788–1858), a Berlin obstetrician, declared in 1852 that there was no other means of preventing a puerperal epidemic except the temporary closing down of all lying-in hospitals.

Semmelweis's old-time enemy, Scanzoni, by then Professor of Obstetrics in Würzburg, launched a renewed attack on him [7] in his handbook, *Lehrbuch der Geburtshilfe* (1849–1852). He introduced in obstetrics the most recent anatomical, pathological and morphological observations of his time. This work had become the most up-to-date textbook of obstetrics in Europe. Both in the first and in the second editions (1853), Scanzoni discussed the aetiology of puerperal fever. He said the following about Semmelweis's theory: "As far as the causation of puerperal fever is concerned, Semmelweis and Skoda drew attention to the question of infection by means of infectious materials generating pus and ichor in the blood. They expressed the view that the very high mortality rate in the 1st Obstetric Clinic in Vienna was due to these circumstances, that is, that the physicians examining the pregnant and labouring women had previously been engaged in dissections, and that the decomposed matter clinging to their fingers was thus introduced into the sexual organs of the persons examined. We were the first to doubt the truth of this hypothesis. Without wanting to deny that in certain cases such infections may occur, it would be going too far to attribute all morbid cases of puerperal fever in the lying-in hospitals to this one and only cause. We are still of the opinion that it is chiefly miasmatic influences in lying-in hospitals which are at the root of the disease, most particularly, atmospheric influences. In other words, the epidemic nature of the evil cannot be denied" [8].

Scanzoni seemed to vindicate for himself the priority of doubting the truth of Semmelweis's teachings. Time has however justified the prophecy Semmelweis made when answering Scanzoni's above statement: "The time will come, I feel certain, when, to put it mildly, Scanzoni will feel sorry that he can no longer



Karl von Braun

blot out from the memory of people the fact that he was the first to oppose my views on puerperal fever".

Nothing could be more typical of the Vienna school than Eduard Lumpe's *Compendium der Geburtshilfe*, a popular obstetric textbook in which the name of Semmelweis is not even mentioned [9].

Karl Braun, the successor to Klein as professor of obstetrics had openly attacked Semmelweis for the first time in 1854, though as a sign of loyalty to his former chief he had never accepted the latter's doctrine. In a book entitled *On the Puerperal Processes*, Braun, quoting the opinions of Kiwisch and Scanzoni on puerperal fever and relying on their evidence, rejected out of hand Semmelweis's theory: "In the literature we can hardly find any authority to support the practical application of the infection theory. There are, on the contrary, reliable arguments and practical observations to contest the validity of the doctrine" [10].

Braun gives a long list of his clinical experiences before rejecting Semmelweis's theory on "cadaveric poisoning", though he himself considered it an act of presumption to permit students to work with pregnant, labouring and parturient women if their hands retained any hint of cadaveric odour. He expressed his disbelief in connection with the chlorine handwash as an effective preventive measure. These statements of his are identical with others contained in the chapter on puerperal fever in an obstetrical handbook published in 1855 in collaboration with Chiari, Braun and Späth, where the said chapter is obviously from Braun's pen [11]. In this chapter entitled "Puerperal Processes, their Treatment and Relation to Other Zymotic Diseases" Braun gives a list of thirty different causes of puerperal fever (discussed in 45 pages), one of which is Semmelweis's "cadaveric infection" [12].

The opposition of Braun, who was considered to be a great authority, must have carried great weight in the fight against the acceptance of Semmelweis's teachings.

Nevertheless, there were instances of publications in support of Semmelweis even in Vienna. Alois Bednar, a paediatrician, head of department at the Foundling Hospital in Vienna, clearly stated in a clinico-pathological monograph that, owing to the application of the chlorine handwash, mortality among the babies had been reduced to a minimum thanks to the teaching of Semmelweis! Bednar called the disease *Sepsis des Blutes* [13].

The Semmelweis doctrine was strongly supported by Edward William Murphy, obstetrician of Dublin and London, director of the Rotunda Hospital [14].

These few voices of approval, however, produced no reaction. Eight years after Semmelweis had made his discovery, Anton Friedrich Hohl, in his textbook of midwifery, published in 1855 [15], described how the accoucheur should prepare for an operation: (*i*) he should take off his jacket, (*ii*) roll up his shirt-sleeve to elbow, (*iii*) smear oil on his arms up to elbow. No mention is made of Semmelweis in the book at all.

In 1857 Anselm Martin, director of the rebuilt lying-in hospital in Munich, had described the puerperal epidemic of 1856–57. He could not clearly ascertain its causes, but as his new hospital was housed in a clean, newly equipped building he could not disregard the possibility of cadaveric infection. Nevertheless he, too, rejected the "Semmelweis theory", and maintained that the disease was contagious and the chlorine handwash absolutely useless [16].

In the autumn of 1857 Semmelweis must have decided to seek publicity, and considering his statistical data collected from various obstetric hospitals insufficient, from 1858 onwards he wrote letters to leading obstetricians who so far had not committed themselves in the question of puerperal fever. Unfortunately most of the replies he received rejected his theory [17].

D. Everken, director of the Training College for Midwives in Paderborn, declared in a letter written on February 17th, 1858 that he had never examined pregnant, labouring and lying-in patients after post mortem practices, but that *post hoc* was not identical with *propter hoc*.

Joseph Alexis Stolz, obstetrician of Strasbourg, answering Semmelweis's letter on March 26th, 1858, remarked that his observations had not been in agreement with the latter's theory on the aetiology of puerperal fever.

Professor Levy of Copenhagen categorically rejected the Semmelweis theory in a letter dated May 21st, 1858.

Karl Theodor Litzmann, the successor of Michaelis, stated in a letter written on September 25th, 1858, that the lying-in hospital under his supervision had to be closed twice on account of the high puerperal mortality, yet he could only attribute this to the prevailing over-crowdedness.

Among the few who publicly recognized Semmelweis's teaching was Joseph Dietl, Professor of Medicine in Cracow, an outspoken representative of therapeutic nihilism, who in his answer to Semmelweis written on April 28th, 1858, stated that in the course of his journeys he had seen that Semmelweis's view had been seriously applied in the buildings of new maternity hospitals where the patients could be properly segregated and the obstetricians were strictly forbidden to deal with cadavers, etc. "One can hear much less these days", writes Dietl, "about the great ravages of puerperal fever. I clearly attribute this to the measures introduced in the observance of your teachings, whether openly admitted or not." Not long before, Dietl had toured Europe so as to write a book on his impressions in the various medical institutions [18].

It was a particularly cheering incident for Semmelweis to receive an answer from J. Liebig in March 1859. The former had asked in his letter why Liebig had left out in the fourth edition a certain statement printed in the third edition

of his *Chemische Briefe* in connection with his teaching. Among other things, Liebig said: "It is obvious how little recognition this great discovery, however important in practical application, has received outside the academy. It is evident that there are also other significant causes of puerperal fever, but that the cause discovered by the perspicacity of Dr. Semmelweis in the Obstetric Clinic of Vienna is one of them cannot be doubted by an unbiassed observer" [19]. In a second letter dated March 21st, 1859 he observes that he did not think it worth while repeating his statement, since he believed that the Semmelweis theory had been universally accepted. In answer to a question by Semmelweis, Liebig confirmed that chlorine had a powerful disinfecting quality.

All the significant personalities in European medicine had continued to oppose the Semmelweis doctrine.

Ten years after Semmelweis's discovery the Medical Academy of Paris could not agree on the aetiology of puerperal fever, and though 18 meetings had been held between February 22nd and July 6th, 1859 no uniform view had been reached and no means had been suggested to prevent the spread of the disease except the closure of the lying-in hospitals. The members of the French Puerperal Commission had all stated their opinions, beginning with their president, Paul Dubois (1793–1871), Professor of Obstetrics, and the "forum summum obstetricium" in France, Leon Jean Cruvelhier (1791–1874), Professor of Pathology, as well as Antoine Constant Danyau (1803–1871), Professor of Surgery. They rejected the teachings of Semmelweis, Dubois stressing that even the Vienna school had long forgotten his name, although his theory had been born there. Each and every member of the Commission attributed different causes to the origin of puerperal fever, without agreeing on its right aetiology [20].

In his famous *Aetiology*, Semmelweis comments on Dubois's statement as follows: "My teachings have not been forgotten in the school where they were born, and my present work purports that they should not be forgotten in the future either, although so far my theory has only been distorted in the school in question . . ." [21].

Virchow again declared himself against Semmelweis in a lecture on puerperal fever in the Obstetrical Society of Berlin in 1859. He named in the aetiology of puerperal fever such factors as: atmospheric conditions, disturbances in milk secretion, excited state of the nervous system, and simultaneous occurrences, as erysipelas, purulent inflammations, etc. Virchow's great authority in medical circles potently contributed to the fact that his "error" prevented the recognition of the Semmelweis doctrine for a long time to come.

Referring to this lecture, Semmelweis declared in his *Aetiology*: ". . . to say nothing of my students, of medical practitioners and surgeons, there are at present 823 of my pupil midwives carrying on midwifery practice in Hungary who know better than Virchow why the majority of epidemics of puerperal fever occur in winter, who know better than Virchow what to do in order to prevent puerperal fever when patients suffering from erysipelatous, croupous, putrid and purulent inflammation are committed to their care and who, more enlightened than the

members of the Berlin Obstetrical Society, would laugh in derision at Virchow if he were to give them a lecture on epidemic puerperal fever" [22].

Semmelweis suffered terribly from these disappointing attacks. He considered it as a direct insult to his person when, in 1859, the medical faculty of Würzburg University gave an award to the book of a clinical assistant, Heinrich Silberschmitt, who had made it a special point to attack the cadaveric poison theory of Semmelweis in the very first paragraph. Silberschmitt tries to justify the epidemic-miasmatic theory of Scanzoni discussed in a treatise by Eisenmann in 1837. He rejects categorically "the Semmelweis theory of cadaveric poisoning", repeating that neither Kiwisch nor Scanzoni had witnessed the beneficial results of the chlorine handwash. No mention is made naturally of the success of the chlorine handwash introduced in the Obstetric Clinic of Vienna [23].

In the same year, a doctor's thesis was published in Würzburg by Gisbert Cathrein entitled *Über das Puerperalfieber*, in which the author repeated the opinion of Kiwisch, Scanzoni, Seyfert, Lumpe and Zipfl in opposition to the doctrine of Semmelweis. Though Cathrein confessed that he had no personal experiences in the matter of the chlorine handwash, on the evidence of the above-quoted authorities he had no reason to doubt that cadaveric poisoning was "not the most frequent cause" of puerperal fever as Semmelweis had seemed to believe, and that the most diligently applied chlorine handwash could not prevent the outbreak of the disease.

Professor Eduard Arnold Martin also sided with the opponents of Semmelweis in his lecture held before the Obstetrical Society of Berlin on November 9th, 1858: "On the inflammation of the vagina, the invasion of putrid exudation into the abdominal cavity as the cause of puerperal peritonitis." So did Hermann Lebert in his treatise on inflammation in 1859.

Summarizing, we can say that a more or less united front had developed in Europe in opposition to the teaching of Semmelweis. His discovery had excited only very little interest in Austria, Germany and France. In spite of the fact that mortality in puerperal fever had not decreased at all, most of the great obstetrical authorities, with only a few exceptions, had rejected the discovery of the Hungarian obstetrician.

It is almost unprecedented in the history of medicine for a doctrine based on tangible facts with uncontested practical results to have been unanimously rejected by the greatest authorities, although it would have delivered mankind of a major evil.

Salvarsan, insulin, and penicillin won over the physicians and were introduced into practice at an astonishing speed. On the other hand, the leading obstetricians of Semmelweis's time were reluctant to recognize his doctrine for at least another

two decades after his death [24]. In the words of Dohrn, the historian of modern obstetrics, "the discovery of Semmelweis is a most momentous event, laying down the foundation of an entirely new science in the medical world" [25].

Semmelweis could not understand the reasons of this strange hostility which eventually contributed to his tragedy. He was convinced that those who rejected his theory had been inspired only by personal animosity. And although his supposition was true in a few cases, we must look for other reasons to understand this attitude.

The Semmelweis discovery, as any other truth, was simple and obvious: This was enough in itself to arouse suspicion. "The Semmelweis discovery was far too simple and clear to win adherents for itself", said István Tóth [26]. This statement seems to be corroborated by a saying of Lumpe uttered in a debate of the Medical Society of Vienna, which we have already referred to. He also stated that if Semmelweis's discovery were true, it could rightly be called the egg of Columbus. This twisted argument seems to say that the discovery was far too simple to be true. It was evidently due to this belief that many physicians had not even tried out the effect of the chlorine handwash, but had rejected it outright.

The instinctive resistance of the conservative mind to everything that is new prevailed. The desire not to leave the beaten track, abhorrence of the new and resistance to fresh ideas have always retarded progress. The "scientific" conservatism of his contemporaries, the natural reaction of the successful doctors had been stronger in the instance of Semmelweis,—so strong indeed that it had even defeated scientific honesty.

"In every community and in every field there have been champions in the service of progress", said László Benedek in his memorial speech on Semmelweis [27], "and there is also a public opinion which, owing to its retrograde character, cannot follow in the footsteps of the creative individual. It is not due to intellectual qualities but to sentimental reactions that the public is lagging behind! The activity of the emotional public, like the collectivized mind, will always form an antithesis to the segregated, responsible individual."

The Semmelweis Doctrine versus the Anatomical Concept

Another factor which made the acceptance of the Semmelweis doctrine extremely difficult was the contemporary anatomico-morphological belief that each disease resulted from organic changes in the structure of the tissues. It coincided with Semmelweis's time that the old, unfounded speculative period ended in medicine, and a more objective pathological anatomical trend arose. According to the objective principles of anatomy Semmelweis's doctrine seemed to lack a well-founded basis. It was in those days that the great physiologist, Johannes Müller had drawn a line between medicine founded on scientific observation and

nature-philosophy. In this scientific atmosphere, the concept of decomposed organic matter was unintelligible and even suspect to the adherents of the anatomical trend [28].

Semmelweis was fully conscious of the value of his discovery in the service of mankind and he was happy to have discovered the cause of puerperal fever and the practical method of prevention. But he did not bother to seek anatomical and histological evidence in support of his epoch-making doctrine. He had arrived at his discovery by empirical means and he concentrated all his energy on practical application in order to save women from the dreadful menace. His simple and clear doctrine could *only* produce palpable results, without being able to refer to clinical experiments that the reviving scientific trend required from every new theory.

Semmelweis's doctrine was not in keeping with the contemporary belief in contagious and infectious diseases. At a time when physicians still thought in terms of miasmatic and contagious influences, Semmelweis spoke of an infection proper. Ever since Frascatorius the idea of infection had existed in medicine, yet it was difficult to reconcile it with the scientific spirit of the age because the backing of bacteriology was still missing [29] for the proper understanding of the concept.

According to the scientific belief of the time, the European obstetricians regarded the disease as epidemic, calling it by the non-descript name of "puerperal dyscrasia". No wonder that they could not, or would not, accept the teachings of Semmelweis: They did not believe that infections could produce diseases at all. It was impossible for them to grasp the notion and meaning of asepsis without knowing anything about bacteria and infections.

His argument became more convincing after bacteria had been discovered. "This man", says Schönbauer, "had anticipated his age by discovering asepsis in midwifery one generation earlier. In Semmelweis's days it was the belief that speculation had no place in medicine any more. Pathologists and physiologists discovered organic changes produced by various diseases and their findings were duly confirmed by experiments. Semmelweis came along and proved his discovery by means of statistical figures. It looked like an anachronism. And on top of it the old favourite beliefs concerning the disease had to be disproved to give place to the new teaching" [30].

That time had not yet come. Virchow promulgated his new theory on wounds and pyaemia in 1840, which excluded all external influences from the aetiology of wounds. He believed that erysipelas was produced entirely by the cold without any external infection, through a completely intact epidermis. Virchow proved too great an authority for anybody to have ventured to offer a new interpretation of wound infection.

How typical of the age it was that when Liebig was told that the putrescence of animal material seemed to be produced by microorganisms, he exclaimed: "As if the flow of the Rhine depended on the speed of the paddle of the Mayence Mill, in diverting the water towards Bingen."

Professional Jealousy of Colleagues

In an article written by Ottó Pertik, Professor of Pathology, in 1888, we can read that, with very few exceptions, the obstetricians of the time attacked the teaching of Semmelweis not so much for personal reasons, but rather because they could not divest themselves of theories—however contrary they were to the pathological conceptions of the time—represented by such authorities as Virchow [31]. Pertik adds to his statement, "yet few of his opponents counted on scientific grounds". This remark again refers to another factor which had impeded the recognition of the teaching of Semmelweis.

It is quite certain that the professional jealousy of the great masters of obstetrics was a very significant factor in the fight against recognizing the discovery of a young, unknown assistant, like Semmelweis.

Schürer von Waldheim admits that the professors grudged fame to an insignificant man who had not as yet made any contributions to the literature, who had not taken part in scientific debates and yet boasted of a great discovery.

Often during his struggles Semmelweis met with professional jealousy, personal motives, hypocritical attitudes, and even flagrant ill-will.

"Semmelweis has expounded his theory clearly", said Podach, "in a logical sequence, and the discovery itself is so simple that resistance to it can only be explained by wounded vanity, personal prejudice, and the professional jealousy of the 'big wig' professors" [32]. Sigerist also maintained that the unwillingness of the obstetricians to recognize Semmelweis's teachings was natural because they were reluctant to admit that they were guilty of neglect of duty [33].

There were also cases of dishonesty in the course of the fight. Some had kept silent about his teachings, others had misrepresented and distorted them, many on the other hand had adopted the chlorine handwash without admitting it. Temesváry explicitly mentioned the case in Scanzoni's clinic in 1887 [34]. Semmelweis himself had noticed ill-will in Karl Braun's behaviour, who became his successor as lecturer at the clinic, and who closed his eyes when the chlorine handwash was carelessly applied which naturally interfered with the statistics about its effectiveness [35].

Distorted Views

It did much harm to Semmelweis to have his teachings described by mistake as the theory of cadaveric poisoning, *die Hypothese der Cadaverosen Infec tion* Already in his lifetime Semmelweis protested because his teachings were given such a one-sided treatment. Nevertheless it pleased his enemies to refer to them as such, using this as a weapon in their fight against him. From a statement made by Späth in 1864 it is evident that the error in connection with cadaveric poisoning had prevented the doctrine from obtaining general recognition.

It is a great pity that many of his own friends had been responsible for spreading this misconception. We have read above that Skoda, in his address to the Academy of Sciences in Vienna, had actually described Semmelweis's discovery as a case of cadaveric infection. Routh had done the same, although he had considered it a holy mission to propagate the theory in England. It was also due to this mistake that Semmelweis's teachings did not receive their deserved recognition in that country.

In those days when the infection theory was nothing more than a myth, a mistake of this kind was forgivable even among experts. The same error, however, made in 1905 was a deliberate distortion. In the great medical history of Puschmann's, published in that year, one of its contributors described Semmelweis's doctrine as the theory of cadaveric poisoning, ascribing the identification of puerperal fever as pyaemia to Simpson. Somewhere else in the work, Wegschneider, on the other hand, describes the Semmelweis theory in its right context, with the appreciation which is due to it [36].

Semmelweis's Unique Personality

We have insisted repeatedly—and we cannot disregard it here—that with his long silence Semmelweis himself was responsible for the survival of his doctrine in a distorted version even after his death.

Semmelweis's address to the Medical Society of Vienna in 1850 would have been a suitable occasion to dispel misunderstanding. Unfortunately, however, the lecture never appeared in print.

It is understandable therefore that, for want of an authentic definition of the infection theory of puerperal fever, the European experts had been compelled to accept what they heard about it from the accounts of the very opponents of that doctrine. This argument is tenable, even though Hebra had described the theory in a short contribution and Semmelweis had published his book without converting any of his adversaries.

It is also undeniable that the strange personality of Semmelweis had raised obstacles to the acceptance of his teachings. Analysing the reasons of the martyrdom of Semmelweis, Professor Hegar said: "What had played the main role? Specific circumstances, the state of science then, the trend and course of research, the personality of Semmelweis, or his contemporaries and colleagues?"—Hegar could find no answer to the question [37].

We cannot but justify Semmelweis's anger and indignation. On the other hand we must admit that his irritable nature, his impatience in argument, the public rebuke of the prominent obstetrical authorities of his time made it extremely difficult for him to convince others of the truth of his point of view and to persuade the public to recognize his doctrine.

His personality, his character and his temperament were responsible for his actions which finally decided his fate. His attitude was naturally the direct out-

come of his specific inner make-up. It was responsible for his passionate, obtrusive appeal when professing his doctrine, involving the very meaning of his life and fate, intimately tied up with the purpose of his strange being. This attitude was apt to arouse interest in his work, but by no means suitable to convince and defeat the weighty resistance of expert adversaries.

Malade maintains that it was more due to Semmelweis's peculiar personality than to the circumstances that he met with so little understanding in his age. This may be true, though it is not the whole truth. Semmelweis, who for a long time had been perfectly sure that he was right, naïvely believed that he could convince every sensible person. But, not being a "realist", he flaunted his truth into the face of the would-be infallible experts of his time. But he could not do anything else: he was the Luther of his profession [38].

Unfavourable Atmosphere in an Oppressed Country

Last but not least, the unfavourable political climate after the military defeat of the War of Independence in 1848–49 also contributed to Semmelweis's failure. Apart from the fact that the opportunities in small countries are always smaller, and bigger nations are liable to belittle their achievements, it was very unfortunate in those days that the discovery was made by a Hungarian. The opinion prevailing in Hungary in Semmelweis's time was not suitable for recognition, on the one hand because of resentment felt against the oppressed Hungarians and, on the other, owing to the situation in the eighteen-fifties when the Austrian Monarchy was on the brink of dissolution.

Weakening Resistance to the Teachings of Semmelweis's Doctrine

Not even the circumstances discussed above could prevent Semmelweis's teachings from finally penetrating into medical science.

In the late eighteen-fifties and in the eighteen-sixties he had gained more credit. In 1878 Max Boehr stated that " . . . after much hesitation in the fifties, in the early sixties the infection theory of puerperal fever was beginning to take a clear and definite shape" [39].

Little by little those who had been scornful of the "cadaveric infection theory", began to take over the method, in secret without speaking about it. Bernard Breslau (1829–1866), a Zürich obstetrician, admitted that he had introduced the chlorine handwash in 1860, but refused to accept the Semmelweis theory [40].

We have mentioned earlier that a Hannover physician by the name of Kugelmann had written letters to Semmelweis in 1861, recognizing the validity of his doctrine.

The medical faculty of the University of Pest unanimously accepted it in a declaration made in 1862. Theodor Huggenberger, director of the Midwives'

Training College in St. Petersburg, informed Semmelweis in a letter that the Medical Society of St. Petersburg, after discussing his doctrine, had fully endorsed it in its debate on June 23rd, 1863. On the occasion of a discussion in connection with the building of a new lying-in hospital in Prague in 1863, Lange, Skoda and Rokitansky announced that they supported the Semmelweis method.

August Theodor Stamm (1822–1892) expressed himself in favour of Semmelweis in 1864. In a lecture before the Gynaecological Society of Berlin on June 29th, 1864 he said that there were voices in the world medical literature supporting Semmelweis's theory concerning the aetiological role of decomposed organic material [41].

It was also in 1864 that August Hirsch (1817–1892), physician and historian, expressed his approval [42]. He was not free from the traditional disbelief to regard the doctrine as one-sided. Nevertheless, four years after the publication of the *Aetiology*, he added as his own view that puerperal infection may be produced not only by cadaveric poison but in fact by any putrescent material. After the appearance of his book general resentment against Semmelweis's doctrine was beginning to give way.

A few of his old opponents remained silent, or here and there began expressing cautious views in favour of his teachings—they who yesterday still had attacked him with heated animosity! Among them first was Professor Späth who, in a lecture before the Medical Society of Vienna on January 16th, 1863, on the general situation in the clinic and specifically in connection with puerperal fever, made a few wary steps in Semmelweis's direction. "It is not the cracking of the *csikós*'s whip which has brought forward the question of puerperal fever", said Späth, "but its dreadful ravages even in our days . . . No one who tries to discover the truth has the right to despise the diverging opinion of others. In order to keep their reputation intact many lying-in hospitals conceal the number of puerperal cases by listing them under different diseases . . ."

Späth had not yet referred to Semmelweis by name, but repeated the usefulness of his prophylactic measures, and insisted that they should be taken by everybody. Nevertheless he still maintained that the cause of the illness was not yet known [43].

"There is no serious obstetrician any more who would oppose the Semmelweis doctrine"

One year later, on February 5th, 1864, Späth delivered another lecture before the Medical Society of Vienna, in which he modified his views. Analysing the mortality figures of the obstetric clinics of Vienna in the previous 30 years, he came to the conclusion that the high mortality there had been due not to cosmic and telluric influences but to puerperal fever which was produced by "putrid and decomposed animal materials and their effluvia".

He also recognized that mortality as a result of puerperal fever in Klein's clinic had never been so low as in 1848, after when Semmelweis had introduced

his new measures. He confessed that he did not agree with Karl Braun, director of the 1st clinic, although he himself attached much importance to ventilation and the isolation of the sick in the fight against puerperal fever.

In this lecture, Späth publicly declared himself in favour of the infectionist theory. He did not hesitate to express the view that no serious member of the medical profession could ignore Semmelweis's teachings, even though they do not admit it in public. He also referred to the experiments of Mayrhofer which clearly proved that Semmelweis was completely justified. Späth also said that he was convinced that Semmelweis would have received more support, had he not maintained that the only cause of puerperal fever was the factor he had put forward, and had he not used a tone no one had hitherto employed in scientific life.

Späth's lecture, and the public confession of his *volte-face* is of utmost importance, even though he emphasized, in the same lecture, that Semmelweis had modified his views in 1861. This is entirely wrong as the essence of Semmelweis's doctrine had received its final form in Hebra's first contribution [44].

In the *Medical Weekly* in 1864 Markusovszky wrote an article entitled "Febris puerperalis rediviva". Commenting on Späth's lecture on January 16th, 1863, he added in his prophetic manner: "We cannot help rejoicing at the enthusiastic reception of Prof. Späth's excellent lecture and we anticipate the time when the medical school of Vienna will be proud of the ingenious and beneficial discovery of its former pupil, sufficiently recognized from the beginning by Professors Skoda, Rokitansky and Brücke" [45]. Markusovszky's prophecy was soon to come true. The medical school of Vienna is no less proud that its obstetric clinic gave Semmelweis the chance to make his momentous discovery than of the fact that this happened in Vienna. In the same way, we Hungarians are proud that it was a Hungarian who started a new period in the history of obstetrics.

It should also be recorded that there were quite a good few people who, after the universal recognition of Semmelweis's doctrine would have liked to vindicate him as an Austrian, thus claiming him in the name of a nation whose experts had been reluctant to mention even his name for decades after his discovery [46].

Professor Späth was not the only one in Vienna to recognize Semmelweis. Halban points to the circumstance that Gustav Braun (1829–1911), Karl Braun's brother, Professor of Obstetrics in the Josephinum from 1861, and director of the Midwives' Training College from 1873, openly admitted his former error and accepted Semmelweis's true teachings, introducing at the same time his prophylactic measures [47].

Semmelweis's Personal Enemies: Karl Braun and Scanzoni

The conscience of the world began to waken. Few continued to doubt the basic truth of Semmelweis's teachings. Yet three outstanding personalities, Scanzoni, Karl Braun and Virchow, had not given up their former views, and for another twenty years retarded the triumph of Semmelweis's doctrine and the universal introduction of his prophylactic measures.

Karl Braun and Scanzoni had been his old personal enemies. Slaughter believes that Braun had become a personal enemy when, in the debate of the Medical Society of Vienna in 1850, Semmelweis answering Lumpe had declared that in the 1st Obstetric Clinic where Karl Braun had been his successor in 1849, the chlorine handwash had been negligently observed.

Two months after Späth's *volte-face* which amounted to a confession, Braun had lectured before the Medical Society of Vienna in April 1864, announcing the installation of a new ventilation and heating system in his clinic. He attributed the decrease in puerperal mortality during 1863 to these, and not to the chlorine handwash introduced in the same year. Concerning the aetiology of puerperal fever he insisted that the main causes should be looked for in bad ventilation and overcrowdedness. He did no mention of Semmelweis at all, and strangely enough, quoted Litzmann as being responsible for suggesting the chlorine handwash to defeat the "contagion" of puerperal fever.

He went so far in his personal animosity as to tell Denman, the famous Dublin obstetrician who visited Vienna in 1862, that Semmelweis's teachings had long been superseded and proved wrong by experience. Twenty years later when it was impossible even for Braun to ignore Semmelweis, he devoted a footnote to him, in the second edition of his textbook, stating that many obstetricians agreed that infection could be produced by unwashed hands and soiled instruments [48].

Scanzoni's hatred goes back to Skoda's first lecture, because it was in connection with Semmelweis's discovery that the lying-in hospital of Prague was shown in a bad light. Scanzoni, who worked in Prague, and who was an exceptional expert and a splendid scholar, was hurt in his vanity. It is difficult to understand otherwise how he could have denied any recognition to Semmelweis right to the end.

However, in the fourth edition of his textbook, in 1867, even Scanzoni was forced to admit that puerperal fever was caused by infection: "We must consider it an achievement of recent times", he wrote, "that the concept of this extremely malignant disease, which unfortunately occurs very frequently, has now been more exactly determined. It is to the untiring research of the last ten years that we are indebted for the fact that puerperal fever is now almost unanimously considered to be an infectious disease. Puerperal fever is an infection caused by the admission of products of putrid decomposition of animal matter into the blood, producing symptoms either of pyaemia or of sepsis, or other changes in the blood . . .

"Furthermore we cannot and will not leave unmentioned the fact that, by his restless and self-sacrificing efforts in this field, Semmelweis has rendered a great service to lying-in women in our hospitals. It is fundamentally due to his efforts that in these institutions more attention than heretofore is being paid to the requirements of modern hygiene." He goes on by saying: "It cannot be denied that we have made great progress in this field in the past two decades. If we do not want to be unjust, it must be confessed that much of this is due to Semmelweis who has been hostile to us all along."

Scanzoni, on the other hand, could not deny his own nature: He could not help recognizing the essential truth of the infection theory in the aetiology of puerperal fever, but he was still insisting that the air in the lying-in wards was the chief vehicle of infection, and restricted the Semmelweis doctrine to specific cases only. "Some have endeavoured to explain", he said, "that the conveyance of decomposed matter from one sick patient to another is not done through the medium of the atmosphere, but that the putrid material is transferred by means of the hand of the examining practitioner, by means of insufficiently washed bed-linen, a syringe and other instruments direct from one patient into the genitals of another lying-in patient. Without wishing to contest that in certain cases the infection can be transferred in this manner, it would be futile to explain either the frequency or the malignancy of the spread of puerperal fever in the lying-in hospitals in this one way only" [49].

Virchow and Semmelweis

Virchow, unlike Braun and Scanzoni, was not Semmelweis's personal enemy. They had not known each other, but owing to his tremendous reputation Virchow constituted the greatest obstacle [50].

In his treatise *Conversations on Life and Diseases* published in 1862, Virchow commended the merits of the methods of natural sciences: "observation and experiment should precede meditation, without any consideration for authority" [51].

The inductive method applied by Semmelweis after all corresponded to the scientific method recommended by Virchow: The courage of his convictions was never affected by prejudice, fear, respect of authority or social consequences.

Nevertheless Virchow never missed a chance to attack the teachings of Semmelweis. He did this first in 1858, in the year his *Cellular Pathology* was published, in a lecture on puerperal epidemics before the Obstetrical Society of Berlin. He described atmospheric conditions, concomitant diseases (erysipelas, purulent inflammation, etc.), disturbances of milk secretion, nervous excitement, etc. as aetiological factors of puerperal fever [52].

It was in answer to this lecture that Semmelweis said: "To say nothing of my students . . . there are at present 823 of my pupil midwives carrying on midwifery practice in Hungary . . . who are more enlightened than the members of the Berlin Obstetrical Society; should Virchow have given them a lecture on epidemic puerperal fever they would have laughed in derision" [53].

At a conference of German physicians and nature-researchers in 1861, Virchow accused Semmelweis of having followed the ancient nature-philosophy: "*Der Kerl spekuliert*", he said. In 1863, when discussing the building of a new lying-in hospital for Prague, he again attacked Semmelweis, although Rokitansky, Skoda and others had stood up in his defence. Virchow gave his opinion as follows: ". . . In my department at the Charité I have had the very best result in the

treatment of puerperal fever, although I was daily engaged in dissections, in touch with cadavers and cadaveric parts" [54].

Nevertheless Virchow somewhat later recognized the teachings of the Hungarian obstetrician. Four years after the publication of Semmelweis's *Aetiology*, in 1864, in his lecture on the aetiology of puerperal fever, he no longer maintained that puerperal fever was not an infectious disease. "I do not deny that there is some sort of infection or contagion, but not in every case of puerperal fever. I recognize the merit of the Vienna school and most specifically that of Semmelweis. They have certainly kept down this dreadful disease, but the infection is not of such a special kind as Semmelweis alleged" [55].

It is unfortunate that Virchow and Semmelweis did not see eye to eye in this question. It was equally unfortunate that a man of Virchow's calibre and advanced views, should, after the fall of the Paris Commune, have given up his ideals of social and scientific progress. In the first period of his activity, Virchow was consumed by the uncompromising desire to serve the progress of medicine but in his *Cellular Pathology* he became the follower of an idealistic, mechanical trend, which he clearly adopted in his method. He maintained that the cell was the only carrier of life and disease, and his theory could be reconciled neither with the external causes of diseases, nor with the Semmelweis doctrine.

Pertik rightly asks the question in his above-quoted treatise: "Can one wonder that Virchow, who considered the cell to be the seat of all diseases, should have hotly defended the autonomy of his cells, and his doctrine of their functional, nutritive and formative impulses, in which he believed the causes of illnesses to reside? Is it not understandable that he directed his first attack against Semmelweis in 1858, in the year of the publication of his *Cellular Pathology*, since the latter's doctrine seemed to him to be an open defiance of his theory of cell-autonomy?"

The author of *Cellular Pathology* could under no circumstances accept Semmelweis's definition: "Puerperal fever is an absorption fever, in which through the conveyance of putrid organic animal material the composition of the blood undergoes a change, causing further complications, such as peritonitis and metritis, phlebitis of the uterus, as the local consequences of blood dissolution" [56].

Semmelweis highly respected the auxiliary help of pathology which contributed to decreasing the significance of the speculative trend in medicine, and therefore he could not share Virchow's views concerning cellular pathology. To demonstrate the underlying differences in their attitudes the following statement made by Semmelweis will be very revealing: "Physiologically puerperal thrombosis has no existence except in Virchow's speculative mind, and certainly not in the uterus of the puerperae. Pathologically it may exist, however, as the localized product of the blood owing to the decomposed animal material, similarly to peritonitis, endometritis, etc." [57].

Semmelweis believed that local complications were only the secondary symptoms of the general process, including the "inflammation of the uterus". This theory appeared in 1858, and coincided with the publication of *Cellular Pathol-*

ogy. Semmelweis's theory could not be reconciled with Virchow's, although both of them recognized a material substance in the disease.

It seems worth mentioning here that Virchow, who in his *Cellular Pathology* had spoken with contempt of the "nerve apostles", had himself attributed an exaggerated role to the nervous condition of the patient in the aetiology of puerperal fever.

Semmelweis did not belittle the function of the nervous system, but he declared: "being a physician, how could I believe that nervous excitement, or fear, could produce such material changes as we find caused by puerperal fever?" [58].

Whereas Virchow as a young man had rendered great service to medicine, his activity was definitely harmful in his old age, and while dwelling on his personal merits, we cannot relieve him of his grave personal responsibility. Virchow not only opposed the teachings of Semmelweis, but set himself deliberately against progressive trends in medicine, because he was hostile to social progress as a whole [59].

The differences between Semmelweis and Virchow in ideological and scientific questions were inevitable, for their roots lay not only in personal animosity, but also in an unabridgable gap in their social conceptions.

Notes

1. F. Kiwisch, Einige Worte über die von Prof. Skoda veröffentlichte Entdeckung des Semmelweis die Entstehung des Puerperalfiebers betreffend. *Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien* (1850) pp. 300–306.
2. *Klinische Vorträge über spezielle Pathologie und Therapie des weiblichen Geschlechts*, vols 1–3 (Prague, 1854–1855).
3. "*Dies hat derselbe Mann geschrieben, unter dessen Leitung das Würzburger Gebärhaus einmal eine Sterblichkeit von 26 v. H. in einem Jahre aufgewiesen hat. Wenn die Geschichte der menschlichen Irrtümer nicht ähnliche Beispiele genug aufweise, möchte man erstaunen, dass ein so genialer und erfahrener Mann in der Art befangen und blind sein konnte.*" Cf. Hegar, *I. Ph. Semmelweis. Sein Leben und seine Lehre*. (Freiburg im Br., 1882) p. 52.
4. Semmelweis, op. cit. p. 403.
5. Note sur le moyen proposé et employé par M. Semmelweis pour empécher ce développement des épidemies puerpérales dans l'hospice de la maternité de Vienne. *Annales d'Hygiène Publique et de Médicine Légale* (Paris, 1851) pp. 281–290.
6. Cf. F. Arneth, *Gynäkologie in Frankreich, Grossbritanien und Irland. Grösstentheils nach Reiseerlebnissen* (Wien, 1853) p. 360.
7. *Deutsche Med. Wschr.* (1891) pp. 922–923 (Nekrolog); zum Gedächtnis an den 40jährigen Todestag von F. W. Scanzoni von Lichtenfels. *Wien. Med. Wschr.* (1931) p. 26.
8. "*Was die Art der Entstehungsweise des Puerperalfiebers durch die eitrige oder jauchige Infection des Blutes durch in den Organismus eingebrachte deletäre Stoffe anbelangt, so haben in neuester Zeit Semmelweis und Skoda die Aufmerksamkeit des ärztlichen Publikums auf diesen Gegenstand gelenkt, in dem sie behaupteten, dass das so ungünstige Sterblichkeitsverhältniss auf der ersten geburtshilflichen Klinik zu Wien nur durch den Umstand bedingt sei, dass die daselbst praktizierenden Aerzte sich kurz vor den Untersuchungen der Schwangeren und Kreissenden in der Leichenkammer aufhalten und so zur Übertragung verschiedener, ihren Händen anklebender deletärer Stoffe in die Genitalien der Untersuchten Veranlassung geben. Wir waren der Erste, der die Richtigkeit dieser Behauptung in Zweifel zog. Wir*

wollen die Möglichkeit einer derartigen Infection für einzelne Fälle nicht in Abrede stellen, man ist aber jedenfalls zu weitgegangen, wenn man die Häufigkeit und Bösartigkeit der puerperalen Erkrankungen in Gebäranstalten einzig und allein auf diesem Wege erklären zu können glaubten. Wir halten den miasmatischen Einfluss für denjenigen welcher in Gebäranstalten seine mörderische Kraft so häufig entfaltet, wobei wir jedoch besonders hervorheben müssen, dass auch hier atmosphärische oder anders ausgedrückt: epidemische Entwirkungen nicht geleugnet können."

9. E. Lumpe, *Compendium der Geburtshilfe mit vorzüglicher Berücksichtigung an der Wiener geburtshilflichen Schule* (Wien, 1854).
10. "*Wir finden in der Literatur nirgends eine Bestätigung über die Zuverlässigkeit der Infectionstheorie in ihrer praktischen Anwendung; wir treffen sogar die entschiedensten Behauptungen und Erfahrungssätze angeführt, welche diese Hypothese ihrer mächtigsten Stützen berauben.*" Cf. K. Braun, *Über Puerperalprocesse* (Erlangen, 1854) p. 131.
11. Chiari, Braun, Späth, *Klinik der Geburtshilfe und Gynäkologie* (Erlangen, 1855).
12. "*Zur Lehre und Behandlung der Puerperalprocesse und ihre Beziehung zu einigen zymotischen Krankheiten.*"
13. A. Bednar, *Die Krankheiten der Neugeborenen und Säuglingen von klinischen und pathologisch-anatomischen Standpunkten bearbeitet.* (Wien, 1850–1853) p. 198.
14. Murphy's article in *Dublin Quarterly Journal of Medical Sciences* (1857) pp. 1–10, was reviewed in *Lancet*, March 28th, 1858.
15. A. F. Hohl, *Lehrbuch der Geburtshilfe* (Leipzig, 1855).
16. A. Martin, Zur Erforschung der Ursachen des epidemischen Puerperalfiebers. *Monatsschrift für Geburtskunde und Frauenkrankheiten* (1857) p. 253.
17. Semmelweis, op. cit. p. 285.
18. J. Dietl, *Kritische Darstellung europäischer Krankenhäuser nach eigenen Reisebeobachtungen* (Wien, 1854).
19. "*Aus diesem Vortrage ergibt sich nebenbei, wie gering die Anerkennung gewesen ist, welche diese grosse, praktisch-wichtige Entdeckung ausserhalb der Akademie gefunden hat. Gewiss werden sich noch mehrere Ursachen des Kindbettfiebers nahmhaft machen lassen; dass aber die vor Dr. Semmelweis mit allem Scharfsinn eines vorurteilsfreien Forschers in der Gebäranstalt zu Wien ermittelte Ursache eine derselbe ist, daran kann wohl kein Unbefangener zweifeln.*" Cf. J. Liebig, *Chemische Briefe*. 3rd. ed. (Heidelberg, 1851) p. 312.
20. De la fièvre puerpérale, de sa nature et de son traitement. Communication à l'Académie de Médecine par M. Guerard, Depaul, etc. Paris, 1858. Verhandlungen der Akademie der Medizin in Paris über das Puerperalfieber. *Monatsschrift für Geburtskunde und Frauenkrankheiten* (Berlin, 1858) pp. 292–315; E. Siebold and R. Dohrn, *Geschichte der Geburtshilfe*. (Tübingen, 1904) vol. III, Part I, p. 98.
21. Semmelweis, op. cit. p. 326.
22. Semmelweis, op. cit. p. 440.
23. H. Silberschmitt, *Historisch-kritische Darstellung der Pathologie des Kindbettfiebers von der ältesten Zeit bis auf unserige.* (Erlangen, 1859) p. 113. Semmelweis had studied the book intensively and it was believed to be a weapon for Scanzoni. Cf. Semmelweis, op. cit. p. 383. Both Schürer von Waldheim and Sinclair considered the book a forgery.
24. The same happened to Auenbrugger in Vienna. Leopold Auenbrugger (1722–1807) discovered auscultation in 1761. Some years before Semmelweis's discovery the medical school of Vienna had adopted the same non-committal attitude. The disregard of Auenbrugger's discovery must have been due to the belief in Vienna that all diseases had been regarded as the symptom of a general constitutional disturbance and not that of an organ.
25. "*In die Entwickelung dieses Zeitraumes brachte erst einen vollständigen Umschwung das Auftreten von I. Ph. Semmelweis.*" Cf. R. Dohrn, *Die Geschichte der Neuzeit. Zugleich als dritter Band des Versuches einer Geschichte der Geburtshilfe von Edward v. Siebold.* (Tübingen, 1904) p. 26.
26. I. Tóth, Semmelweis serlegbeszéd (In memoriam Semmelweis). *OH* (1927) p. 131.

27. L. Benedek (1887–1945), Professor of Psychiatry in Budapest University. Cf. Semmelweis. Serlegbeszéd. (Semmelweis. Memorial speech). *Orvosképzés* (*Medical Training*). (1937) p. 22.
28. Johannes Müller (1801–1858), founder of experimental methods in natural sciences, and head of the great physiological school to which proudly belonged Helmholz, Virchow, Henle, Dubois-Reymond, Schwamm, Brücke, Karl Ludwig and Kölliker.
29. O. Bauer, Einst und jetzt. Das Puerperalfieber. *Münchner Med. Wschr.*, vol. 100 (1958) pp. 901–905.
30. "*. . . dieser Mann etwas vorwegnahm, was einer späteren Generation vorbehalten war: Die Asepsis. Die Zeit, in der Semmelweis lebte, pries sich glücklich, das spekulative Moment in der Medizin weitgehend zurückgedrängt zu haben. Man folgte dem Pathologen und dem Physiologen, die ihre Ansichten über die Krankheiten durch sichtbare Veränderungen im Organismus belegten oder mit einem Experiment bestätigten. Semmelweis bewies seine Lehre mit einer Statistik. Das musste als Anachronismus empfunden werden. Dazu waren die alteingesessenen Anschauungen zu überwinden um Raum für die neuen zu schaffen.*" L. Schönbauer, *Das Medizinische Wien. Geschichte, Werden, Würdigung*. 2nd ed. (Wien, 1947) p. 484.
31. O. Pertik, In memoriam Semmelweis. *OH* (1888) pp. 209–210.
32. E. Podach, Zur Geschichte der Semmelweis-Lehre. *Zeitschrift f. Geb. u. Gyn.* (1948) pp. 59–61.
33. H. E. Sigerist, *Grosse Ärzte* (Basel, 1934).
34. R. Temesváry, Semmelweis serlegbeszéd (In memoriam Semmelweis). *Gyógyászat* (*Medical Practice*) (1933) pp. 122–125. In his speech, he referred to his article: In memoriam Scanzoni. *Wiener Med. Wschr.* (1932), describing a visit to Scanzoni's clinic at Würzburg in 1887. Seeing the low puerperal mortality statistics, the author had expressed his astonishment. The assistant accompanying him informed him that, without their chief's knowledge, they were applying the Semmelweis prophylaxis.
35. Semmelweis, op. cit. p. 446.
36. Theodor Puschmann (1848–1899), Professor of Medical History in the University of Vienna, 1879–1899, *Handbuch der Geschichte der Medicin* (Jena, 1905). In a chapter on modern surgery in vol. III, p. 25 Helfreich presents the Semmelweis doctrine in a distorted shape. In the same work, M. Wegscheider confirmed that it was Semmelweis who discovered the aetiology of puerperal fever, identifying it with pyaemia (pp. 940–942).
37. "*Spielen die Zeitverhältnisse, insbesonders der gleichzeitige Stand der Wissenschaft, die Richtung und Gang der Forschung die Hauptrolle, lag der ausschlagende Moment in der Persönlichkeit der Beteiligten, oder tragen die Zeit und Berufsgenossen der Hauptheile?*" Cf. Hegar, op. cit. p. 5.
38. The expression "the Luther of medicine" was used by Abraham Lincoln Blesh (1866–1943), Professor of Surgery in Oklahoma University, in Puerperal Fever, Etiology, Prophlyaxis and Treatment. *The North American Practitioner* (Chicago, 1889) pp. 209–226.
39. "*. . . da wurde in langsamen Geburtswehen in den 50-ger und im Beginn 60-er Jahren immer klarer und immer deutlicher die Infectionstheorie des Puerperalfiebers geboren.*" Cf. Max Boehr, Untersuchungen über die Häufigkeit des Todes im Wochenbett in Preussen. *Zeitschrift f. Geb. u. Gyn.* (1878) pp. 16–151.
40. B. Breslau, Die Gebäranstalt in Zürich. *Vertheidigungsschrift* (Zürich, 1863).
41. A. Th. Stamm, Über die Vernichtungsmöglichkeit des epidemischen Puerperalfiebers. *Wiener Medizinische Halle* (1861) p. 80.
42. A. Hirsch, *Handbuch der historisch-geographischen Pathologie* (Erlangen, 1859–1864).
43. "*Sie (die Wochenerkrankung) ist wieder in den Vordergrund getreten, nicht etwa weil sie wach gerufen wurde durch den grausen Knall des Csikóspeitsche, sondern weil die zeitweiligen Verheerungen . . . die grosse Wichtigkeit zeigen . . . Darum hat aber auch niemand das Recht . . . einen Andersgläubigen zu beschimpfen oder zu verachten, wenn dieser nur nach Wahrheit strebt . . . nicht selten sowohl Aerzte in Privathäusern, als auch solche an öffent-*

lichen Anstalten: denn die einen sowohl wie die anderen stellen oftmals statt der wahren Diagnose absichtlich die einer in ihren klinischen Erscheinungen ähnliche Erkrankung hin." Cf. Späth, Über die Sanitätsverhältnisse der Wöchnerinnen an der Gebärklinik für Hebammen in Wien vom Oktober 1861 bis Januar 1863. *Medizinische Jahrbücher* (1863) pp. 102–127.

44. Späth, Statistischer und historischer Rückblick auf die Vorkommnisse des Wiener Gebärhauses während der letzten 30 Jahren unter der Berücksichtigung der Puerperalerkrankungen. *Medizinische Jahrbücher* (1864) p. 1.
45. Markusovszky, Nő- és gyermekgyógyászat (Gynaecology and Paediatry). *OH*, vol. 8 (1864) pp. 12–13. His prophetic statement was soon taken over by international literature, the same as his reply to Breisky, quoted above. Cf. Erna Lesky, Die Wiener geburtshilflich-gynaekologische Schule. Geist und Leistung. Opening address at 3rd World Conference of Fédération Internationale de Gynécologie et d'Obstétrique. Wien, Sept. 4th, 1961. Markusovszky also discussed Späth's lecture of February 5th, 1864. Cf. Nő- és gyermekgyógyászat (Gynaecology and Paediatry). *OH*, vol. 8 (1864) pp. 52–54. For the lecture cf. *Med. Jahrbücher* (1864) pp. 145–164. Here Späth stated, according to Markusovszky, "that there is no expert obstetrician who would not be convinced of the truth of the theory, whatever he might say against it".
46. F. H. Hueppe (1852–1938), Professor of Hygiene in Prague University, stated at the VIIIth International Conference for Demography and Public Health in Budapest, on Sept. 2nd, 1894, to the general consternation to those present, that the discovery of Semmelweis "was great honour to his German nation". Schürer von Waldheim again considered Semmelweis as an Austrian. Other statements in the otherwise excellent biography are not less controversial. Waldheim believes that Semmelweis was not happy in Pest, and wished to be back in Vienna, he states that he was not appreciated in Hungary by his colleagues, including János Balassa. Waldheim also states that Semmelweis hardly ever lectured in Hungarian, as he spoke the language badly. T. Győry has refuted these statements one by one. Cf. *OH* (1905) p. 575. He is effectively contradicted also by Navratil (see p. 123). Schürer von Waldheim, in his reply to Győry, accuses the latter of being prepossessed out of patriotic pride. Cf. *Aerztliche Reform Zeitung* (1907) pp. 15–16. A few weeks after the publication of Schürer von Waldheim's biography, a book appeared by Theodor Wyder, Professor of Obstetrics of Zürich (1853–1926), entitled: *Die Ursachen des Kindbettfiebers und ihre Entdeckung durch I. Ph. Semmelweis* (Berlin, 1906). Wyder considers Semmelweis a great representative Hungarian, saying: "As the present holder of the chair of obstetrics in the University of Zürich, to which Semmelweis had been invited in 1857, I consider it my sacred duty, to offer my present book as a token to the Semmelweis memorial monument to be erected in Budapest." Others have also objected to the assumption of presenting Semmelweis as an Austrian, where he had never been treated adequately. Max Neuberger in an article in *Die Wiener Medizinische Schule im Vormärz* (Wien, 1921) p. 312, has the following comment to make: "*In Österreich wurde sein Name, sein Wirken fortan systhematisch unterdrückt und ganze Generationen von Medizinern wurden herangebildet, welche in den Vorlesungen den Namen Semmelweis nie zu hören bekamen.*" W. J. Sinclair in his famous biography presents the question as follows: "Since Semmelweis ended his life of suffering and persecution, mainly at the hands of German university professors, and acquired a world-wide celebrity of which any nation might be proud, attempts have been made to claim him as of German nationality, and even specifically as Austrian. This claim is absurd. Semmelweis was Hungarian in everything but name. The history of Hungary tells of German colonies planted for generations throughout the length and breadth of the land from Pressburg to Transylvania in the attempts to Germanize Hungary. Instead of becoming German, Hungary largely assimilated the foreign element, and one of the most prosperous of the assimilated colonies was that of Ofen or Buda, the royal palace, and only separated by the Danube from Pest, the most populous and flourishing of all the Hungarian towns. To claim Semmelweis as an Austrian

would be just as fair and reasonable as to claim any distinguished Irishman of Ulster whose forebears had been in the North of Ireland . . . as a Scotsman, because he bore a Scottish name, or to claim even Parnell, the Irish patriot as an Englishman, because his name was not autochthonous Irish. Semmelweis was a true Hungarian by birth, temperament and education, and he and his brothers proved in the troublous times of revolution and civil war that they were Hungarian patriots who could make great sacrifices for their country." Cf. The Tragedy of a Hungarian Physician. An English book about Semmelweis. *Budapesti Hirlap* (*Budapest News*), August 29th, 1909. It is even remarked by the American physician and writer Danforth that the Germans who "had considered Semmelweis before he ended his life as a theorizing Hungarian, claim him since as an Austrian national". Cf. The Beginnings of Asepsis. *Proceedings of the Institute of Medicine of Chicago* (1945) p. 425. Although the error of considering Semmelweis a foreign national was not due to historians, literature had not worried too much about it. It was again after 1933 that fascist Germany claimed Semmelweis as a German. Cf. Bernhard Knoche, Semmelweis, ein Kämpfer für Wahrheit. *Nationalsozialistische Monatshefte* (München, 1942) No. 139, p. 835; Hans Bleyer, *Semmelweis, der Retter der Mütter* (Ujvidék, 1942) p. 18. In 1936 Győry had considered it important to collect all his incontestible evidence to prove the Hungarian nationality of Semmelweis. Cf. T. Győry, Die Abstammung des I. Ph. Semmelweis. *Deutsche Med. Wschr.* (1936) p. 787.

47. *Deutsche Med. Wschr.* (1911) p. 556.
48. It was mainly due to Braun's influence and information derived from him that Denman confirmed: ". . . with respect to the opinions put forth by Dr. Semmelweis of Buda–Pesth . . . I feel that it would only be a waste of time to dwell upon them . . . I mention that I have lately visited the hospital in Vienna and that . . . Dr. Braun informed me that the theory put forward by Dr. Semmelweis had been entirely upset during the last outbreak of puerperal fever." Cf. *Dublin Quarterly Medical Review* (1862) p. 317; K. Braun, *Lehrbuch der gesamten Gynäkologie*. 2nd revised ed. (Wien, 1881).
49. "*Wir müssen als eine Errungenschaft der Neuzeit zu betrachten, dass der Begriff dieser äusserst perniciösen und leider so häufig zu Beobachtung kommenden Krankheit gegenwärtig genauer festgestellt werden kann, als dieses noch vor kurzem der Fall war. Den unermüdlichen Forschungen der letzten zehn Jahre verdanken wir es, dass das Puerperalfieber jetzt mit beinahe ausnahmloser Übereinstimmung als eine Infektionskrankheit betrachtet wird. Das Puerperalfieber ist eine Infektionskrankheit hervorgegangen aus der Aufnahme putrider Zersetzungsproducte animalischer Stoffe in die Blutmasse, welche letzteren Veränderungen erfährt, die sich gewöhnlich durch die der Pyemie und Septichemie oder Blutdissolution zugeschriebenen Erscheinungen ausspricht. Übrigens können und wollen wir nicht unerwähnt lassen, dass sich Semmelweis durch seine rastlosen und aufopfernden Bemühungen auf diesem Felde ein grosses Verdienst um die in Gebärhäusern verpflegten Wöchnerinnen erworben hat; denn seinen Bemühungen ist es wesentlich zu danken, dass den hygienischen Verhältnissen in diesen Anstalten gegenwärtig vielmehr Sorgfalt zugewendet wird, als es noch vor kurzer Zeit der Fall war. Es lässt sich nicht leugnen, dass wir gerade auf diesem Gebiete im Laufe der letzten zwei Decennien wesentliche Fortschritte zu registrieren haben und wollen wir nicht ungerecht sein, so müssen wir dem uns während seines Lebens so feindlich entgegenstehenden Semmelweis unsere vollste Anerkennung aussprechen. Man hat angenommen, dass die Übertragung der deletären Stoffe von einem Kranken auf die andern nicht durch das Medium der Luft, sondern dadurch stattfände, dass von einem Kranken gelieferten in Fäulniss übergegangenen Stoffe mittelst der Hände der untersuchenden Aerzte, mittelst der nicht gehörig gereinigten Unterlagen, Schwämme, Injectionsrohr und andere Utensilien unmittelbar an und in Genitalien anderer Wöchnerinnen verpflanzt werden. Wir wollen die Möglichkeit einer derartigen Infection für einzelne Fälle nicht in Abrede stellen, aber es ist ein eitles Bemühen die Häufigkeit und Bösartigkeit der puerperalen Erkrankungen in Gebäranstalten einzig und allein auf diesem Wege zu erklären.*" Cf. W. F. Scanzoni, *Lehrbuch der Geburtshilfe*. 4th ed. (Wien, 1867) p. 436.

50. F. Bruck, Semmelweis und Virchow. *Sudhoffs Archiv f. Geschichte der Medizin und der Naturwissenschaften* (1930) p. 387.
51. Cf. Virchow, "*Zuerst die Beobachtungen und der Versuch, dann das Denken ohne Autorität, die Prüfung ohne Vorurteil.*" In *Reden über Leben und Kranksein.*
52. "*Für das Vorkommen von Puerperalfieberepidemien sind wesentlich zwei Umstände von Interesse: die Witterungszustände und die gleichzeitigen Erkrankungen. In ersterer Beziehung scheint es, dass grösste Menge der Epidemien in den Wintermonaten vorgekommen ist. Zu den gleichzeitigen Erkrankungen gehören nebst akuten Exanthemen hauptsächltich ausgedehnte erysipelatöse, croupöse, jauchige und eitrige Entzündungen.*" Cf. *Monatsschr. f. Geburtskunde* (1858).
53. Semmelweis, op. cit. p. 440.
54. "*Ich selbst habe, während ich täglich mit Leichen und Leichenteilchen beschäftigt war, auf meiner Abteilung in der Charité jahrelang Wöchnerinnen mit dem besten Erfolge behandelt.*" Cf. *Wiener Medizinische Halle* (1865) p. 113.
55. "*Ich leugne nicht die Infektion oder Kontagion, aber ich gebe sie nicht für alle Fälle von Wochenbettfieber zu. Ich verkenne nicht das Verdienst, welches sich die Wiener Schule und namentlich Semmelweis um die möglichste Beschränkung dieser verheerenden Krankheit erworben hätte, aber ich sei überzeugt, dass man die Bedeutung der Infektion übertrieben habe.*" Cf. *Monatsschrift f. Geburtskunde* (1864); Podach, *Zeitschrift f. Geb. u. Gyn.* (1948) p. 67. Here Podach maintains that Virchow had not been familiar with Semmelweis's epoch-making work.
56. Semmelweis, op. cit. p. 40.
57. Semmelweis, op. cit. pp. 436, 498.
58. Semmelweis, op. cit. pp. 100, 670.
59. Boenheim remarked in connection with Virchow's hostility towards Semmelweis that the former had taken the same attitude towards Darwin, Koch and the new science of bacteriology. Cf. *Virchow, Werk und Wirkung* (Berlin, 1958) p. 329.

Chapter Seven

Illness and Death

Semmelweis's changed personality after 1862 — Acute mental disease — In the Lower-Austrian Mental Home — Death — Contemporary obituary notices — Markusovszky's farewell — Did Semmelweis suffer from an organic disease of the brain? — Statements by Regöly-Mérei, Haranghy and Nyirő

Semmelweis's Changed Personality after 1862

Semmelweis had every reason to believe that the publication of his classical book would induce the leading obstetricians of Europe to unite to defeat puerperal fever. Although he never stopped believing in the final victory of his doctrine, the unfavourable reception of the *Aetiology* and *Open Letters* must have been a bitter blow to his sensibility. Failure made him desperate but not unhopeful, and the triumph of his doctrine had become the ultimate object of his life. "The puerperal sun" had never set on his horizon.

One of his medical students recorded that, after 1862, he never ceased concentrating on the question of puerperal fever, whatever the subject of his lectures were he was sure to wind up by returning to it [1].

His last contribution to the question of puerperal fever was in 1863 when, to his great joy and satisfaction, Huggenberger, director of the Midwives' Training College of St. Petersburg, informed him of the favourable reception given to his doctrine at a meeting of the obstetricians of St. Petersburg on June 23rd, 1863. Semmelweis translated into Hungarian the full proceedings of the meeting at which his teachings were discussed and published the full text in the *Medical Weekly*. This was exultation and great contentment, although the last [2].

He had hardly taken any notice of the favourable opinions now voiced by Späth, Hirsch and others. He no longer seemed able to rejoice in late recognition. On the other hand, he had much pleasure in his gynaecological practice, and was preparing to write a gynaecological textbook.

But the long years of controversy, the bitter disappointment and failure had seriously undermined his nervous system. From that time (1862–1863) onwards a distinct change had set in and his contemporaries became more and more worried about him. He no longer struggled with his old undaunted spirit, he became easily excitable and irritable, followed by bouts of extreme depression.

Contemporary evidence, based on the personal experiences of friends (Markusovszky, Hirschler, Fleischer, Arneth), and Semmelweis's widow seem unanimously to agree that a complete physical and psychological change had taken place

in him in 1863. Semmelweis who, up to then, had been of a pleasurable disposition became moody and misanthropic, and even apathetic at times.

The physical changes are obvious from the surviving photographs from the various periods of his life. He had aged very much in the last years. The pictures taken in 1863 and 1864 show an old man with a beard, and although the modern observer may be misled by the beard, if we examine his picture taken in 1860, when he was 42, we can clearly see that it is one of a man many years older than his age.

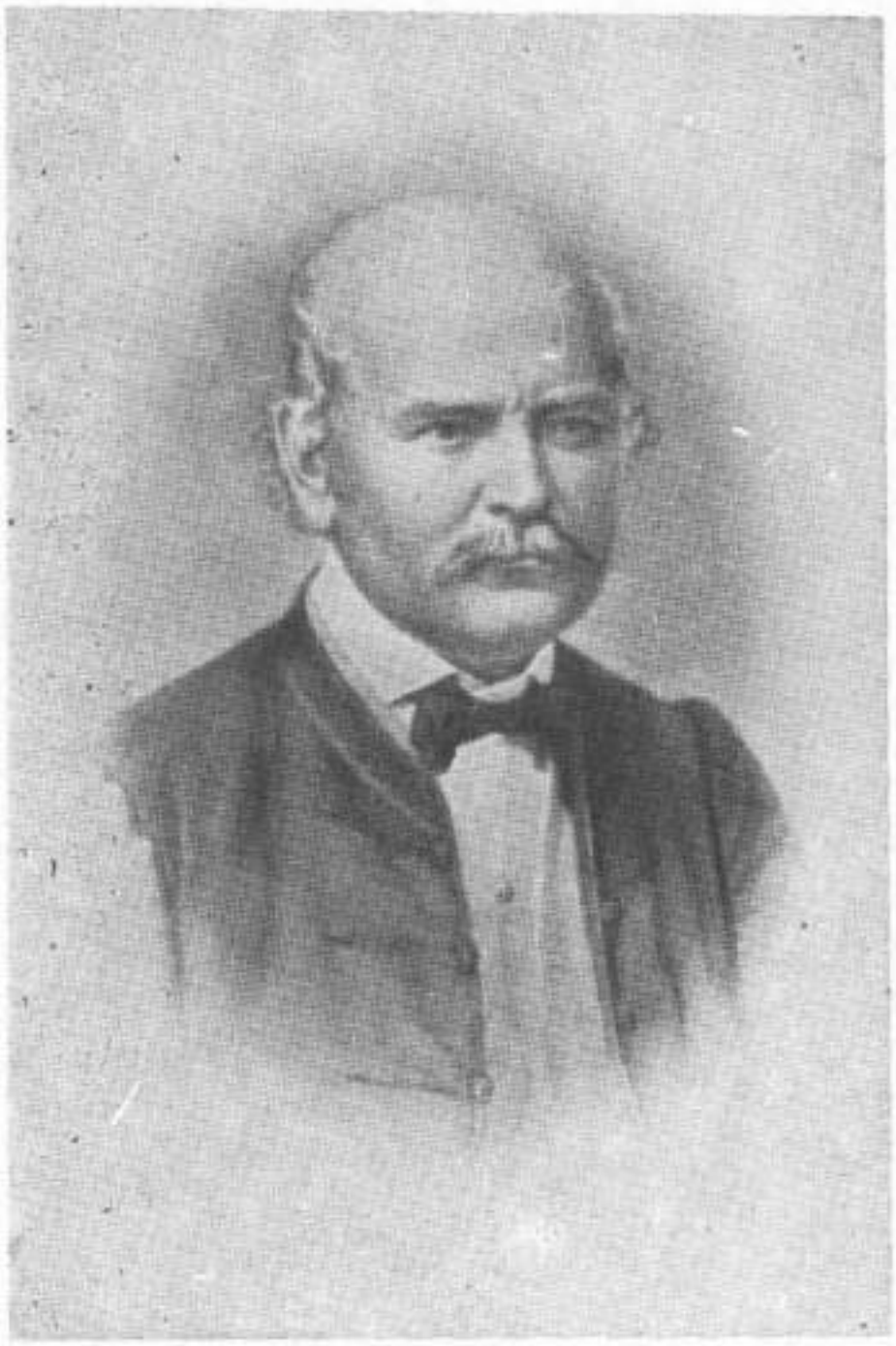


Semmelweis in 1860

On the "evidence of sources from Vienna and Budapest", Pachner in his Semmelweis biography published in 1959 says that Semmelweis's health broke down completely at the end of 1864 and early in 1865 he had difficulties in moving about. His mental make-up had also changed. He was constantly reverting to the theory of puerperal fever and was extremely vexed by anything that seemed like a contradiction, even if uttered by a friend [3].

Many of Semmelweis's biographers suppose that Semmelweis had not been normal many years before his death, not even at the time he wrote his famous book. Others have gone further, speaking of "chronic insanity". There are other writers who, referring to the uncompromising attitude of the Open Letters, maintain that he must have been insane when he wrote them. The passionate and irate tone of his later communications gave rise to the suspicion in some that these must be regarded as the first symptoms of insanity. Creutz and Steudel definitely believe that Semmelweis suffered from chronic insanity the symptoms of which had been evident years before his death [4].

Schürer von Waldheim, author of the first significant Semmelweis biography, shared the same view, and influenced naturally many other biographers. Waldheim says that Semmelweis's behaviour had been eccentric ever since 1859, and that his book bears witness to reduced intellectual activity. Waldheim insisted that the "atrophia cerebri" revealed by the autopsy could not have developed in the last years only [5]. In his speculation this biographer goes as far back as to regard Semmelweis's sudden departure from Vienna in 1850 as the first sign of the malady.



Semmelweis in 1861

Paul Zweifel, a loyal admirer of Semmelweis, summed up his thoughts in 1897 as follows: "How very tragic that such a logical, talented brain should have succumbed to insanity. A disease of that kind does not develop suddenly but only by slow degrees, and those nearest to the afflicted person are the last to perceive it. Also in Semmelweis's case it developed slowly, first producing signs of excessive absent-mindedness. Later he became so irascible that he was unable to see anybody else's point of view, this state alternating with chronic depression and melancholia. Nevertheless, until July 1865 he could still do his work in a satisfactory manner" [6].

G. Theodor Gram describes his "nervous breakdown" as follows: "The disheartening experiences of the previous years were not without their influence upon his mind. The irritability which he manifested at times, the ill-advised expressions and frequent repetitions in his later writings, the loss of memory and seasons of depression followed by enthusiasm for his conviction, were unfortunately the precursors of the disenthronement of a magnificent intellect" [7].

Hegar writes: "His mental irritability had increased ever since he had become involved in extensive literary commitment. Inducement to write was also caused by chronic impulses, and his great book was followed, in quick succession, by his controversial letters addressed to professors Siebold, Scanzoni, Späth, and the last one addressed to all the professors of obstetrics. Unrestrained argumentation, the use of strong language, words of abuse and constant repetition—all these point to the abnormal activity of psychic factors. At a later stage, Semmelweis began long harangues in the streets accompanied by demonstrative gestures, trying to convince even the layman of the truth of his doctrine. His eccentric behaviour, his loss of memory and absent-mindedness were also very revealing symptoms. His excited state of mind and uncompromising humour were followed by intermittent periods of depression and melancholia. Still later he became childish, greedy and excessively sensuous, using obscene language. The disease had developed very slowly, and neither his family nor his friends had seen the initial menace. Until the summer of 1865 he could meet the requirements of his office

and duties. From then on, deterioration was very rapid and soon he had to be confined to a lunatic asylum in Vienna" [8].

Many others have fully endorsed the above-quoted opinion. We can read in Kézmárszky's posthumous textbook [9] the following: "Constant preoccupation with one idea had soon deranged his mind and his confusion had assumed such a shape that, in July 1865, he had to be confined to a lunatic asylum in Vienna."

At the Semmelweis Memorial Festival held in the university hall on September 30th, 1906 and on the previous day in the Medical Society of Budapest, Tibor Győry expressed his views as follows: "... we cannot deny that the strain of fighting for the victory of his doctrine had gradually undermined his nervous system ... His mind could not stand more ... In July 1865 his fate was sealed, and with his mind deranged he had to be removed to a lunatic asylum."



Semmelweis in 1863

Pertik maintained that "the tragedy of Semmelweis", his insanity, was mainly due to the strain of knowing himself in the right and not being able to convince others of it. This resulted in the final collapse of his moral order [10]. This seems to be the opinion shared by most of Semmelweis's biographers.

Victor Robinson (1886–1947), American medical historian, has no doubts about Semmelweis's insanity [11]. Kussmaul believes that "the struggles of the last years must have contributed to the derangement of that deeply feeling man's mind". Ralph Major is convinced that Semmelweis had developed definite symptoms of insanity as early as 1864 [12]. Joseph A. Daly writes that the appearance of Semmelweis's great book doubled the number of his enemies and "the unfortunate man drifted into dementia" [13]. Károly Burger says: "His system was undermined by the useless struggle for recognition, he was unable to finish his last letter addressed to all the professors of obstetrics, because his mind had become unhinged in the meantime" [14]. Maximilian Zeissl, on the other hand, is convinced



Semmelweis in 1864

that the statement, "a Hungarian midwife knows more about puerperal fever than Virchow" is an evident symptom of developing insanity [15]. E. Ebstein and G. Venrel believe that the excited tone of the Open Letters clearly implies insanity, or paralysis, in its early stage [16].

Semmelweis's widow conveyed the same impression when answering questions addressed to her in 1906. She maintained that she had not perceived definitely that her husband was insane before July 13th, 1865, but for four years previously he had suffered from nervous complaints. It was at that time that he produced his momentous book, she said, and it was then that persistent persecution unhinged his mind [17].

W. J. Sinclair is amazed by the fact that the Hungarian doctors, the intimate friends of Semmelweis, should have passively observed how he was drifting into "obvious dementia". In his classic biography, he expressed this view as follows: "... during lectures and medical meetings, even in public streets where he became an object of derision, scenes occurred which must have convinced his medical friends that Semmelweis could no longer be considered a sane man. Their forbearance seems inexplicable to the modern reader. He might have been a royal lunatic, concerning whom no man dare take the initiative" [18].

In spite of the complete agreement of views in the literature, we cannot accept the opinion that Semmelweis was insane years before his mental collapse in the summer of 1865. The changes that affected his personality impairing his physical condition had left his intellectual faculties unaltered. Except for the few weeks preceding his death, he had continued his activities in the social, medical and scientific field. There was no sign of any decline in his work either as university professor or as the economic superintendent of the medical faculty [19]. He also made important progress in gynaecological surgery and contributed an interesting article to the *Medical Weekly* entitled "The Operative Treatment of the Ovarian Cyst", which appeared on July 18th, 1865.

It is not difficult to understand the passionate tone of his writings endeavouring to give way to his righteous indignation in the face of the big-wigs of science [20].

In his book on puerperal fever, he wrote in a perfectly objective tone when discussing the arguments of his adversaries. His book on puerperal fever was matter of fact and objective, not adverse to the views of his opponents. His passionately aggressive Open Letters were written much later to those potentates in obstetrics who called his book extravagantly fanciful, the work of an obsessed maniac, as well as to those who had made it a point to regard it as non-existent.

The reader who studies the lines in his book in which he explains his aggressive attitude, or the closing passage, or his Open Letter to Professor Siebold full of deep humanity, cannot possibly give credence to the opinion that Semmelweis was insane at the time when he wrote his *Aetiology* and his Open Letters.

This opinion is supported by the statements of Zweifel and Hegar who although believing that Semmelweis suffered from chronic insanity both insisted that, until the summer of 1865, he was able to perform all his duties in the most satisfactory manner.

Győry, the greatest Semmelweis researcher, who has made the most intimate study of every phase of his life, reviewing an article written by Destouches, entitled "The Last Days of Semmelweis", expressed the unequivocal opinion that the symptoms of acute insanity in July 1865 had been sudden and unexpected. Previously only nervous troubles had been diagnosed [21].

Acute Mental Disease

It was not before July 13th, 1865, that the dreadful suspicion had dawned on Mrs. Semmelweis that her husband was not quite sane. From that day on he became extremely restless, arguing passionately with his opponents during nights. It was impossible to persuade him to go to bed and rest properly. But it was only at a faculty meeting of the university that his state became quite obvious [22].

In a memorial speech in 1872 his former assistant, József Fleischer, related the incident in these words: " . . . at a faculty meeting held in July 1865, Semmelweis had to read a report about filling a vacancy of lecturer's post in his department. When called upon to do so, he rose, took a piece of paper from his trousers-pocket and, to the stupefaction of those present, began to read the text of the midwives' oath . . . There being no doubt any longer about his condition, his astounded colleagues took him home. This was the last function he performed in his faculty, which had lost the most accomplished, and the most illustrious of its professors [23]. Unfortunately those were also the last words spoken by Semmelweis in the medical life of Hungary.

Semmelweis's nephew, Kálmán Müller, described the tragic event at the faculty meeting as follows: "His nervous state had been deteriorating from day to day, till at last—not unexpectedly to his family and friends—in the overheated atmosphere of a faculty meeting, his nervous system broke down completely" [24].

The rector of the university, György Schopper, reported to the Presidential Council on August 7th, 1865, under No. 1 084 on Semmelweis's illness in these words: "With reference to the petition of the University Council under No. 1 027, concerning the promotion of the same, the Dean of the medical faculty regrets to announce to Your Excellency that Dr. Ignác Semmelweis, Professor of Obstetrics in our University, has, owing to his recently developed mental condition, been placed under medical supervision. The medical faculty, having the obligation to make provisions for the possible nomination of a deputy, reports herewith on the sad occurrence."

After the ominous meeting of the faculty, the doctors present examined Semmelweis, and after performing phlebotomy, placed the patient under sedation. Professor Balassa sent two physicians to provide strict medical supervision [25].

In the Lower-Austrian Mental Home

Semmelweis's friends and attending physicians, János Balassa, János Bókay and János Wágner tried to treat the patient in his home, hoping that when his condition improved he could be taken to a small health resort, Graefenberg, in Silesia. However he deteriorated so rapidly that it became evident to them that the baths of Graefenberg would not help, and that he would have to be taken to a mental home.

In the memorial speech quoted above, Fleischer described the mental collapse of his superior in these words: "In the last few weeks of his life, his lucid, brilliant mind had clouded over: his behaviour in private life, his forgetfulness and childishness began to worry his family. Soon this became apparent in his work at the university, in the clinic, at the faculty meeting, and everywhere where his former lucidity and good conduct had been admired . . . In the second half of July it became obvious that his sanity was gone. His behaviour steadily grew more strange: he visited patients during the night, his moodiness was more accentuated. It had become impossible to control his passionate outbreaks, and his family, losing all hope, consented, at the advice of friends and physicians, to place him under the care of a mental institution—to which he was confined in Vienna on July 31st, 1865."

With a certificate signed by the three attending physicians the sad train journey began on July 31st, 1865 [26]. Semmelweis was accompanied by his wife, their youngest daughter, his wife's uncle, and his assistant, Dr. István Báthory (1835–1901). They were met at the station in Vienna by Professor Hebra, who very adroitly persuaded Semmelweis that he would be taken to his new private sanatorium for treatment. Unsuspecting, Semmelweis was taken to the Lower-Austrian Mental Home and placed under the care of the chief physician, Dr. Mildner, who confined Semmelweis to the ward of "maniacs".

Many biographers, including Johannes Grosse, believe that the journey to Vienna took place on July 20th, but Dr. Fleischer, Schürer von Waldheim, Győry

and Temesváry all agree that it was certainly on July 31st, 1865. In both his books Győry confirms this date: in his memorial speech in 1906 he mentions the same date and he insists on it in his reply to an article written by Destouches [27].

Other biographers argue again that it was not Hebra, but Professor Skoda who made arrangements for Semmelweis's confinement to a lunatic asylum. There is no evidence whatever to confirm this statement. As we have said above, Semmelweis was taken to Vienna with a medical certificate issued by his Hungarian physicians, and was placed at their suggestion in the lunatic asylum with Professor Hebra's help.

The question has often been asked: Why did Semmelweis have to be taken to Vienna at all, when a very competent private mental home existed in Buda. It had been opened in 1850 by Ferenc Schwarzer and was re-equipped in 1863, with a department for nervous patients added to it [28]. This arrangement was probably due to the fact that the director of the newly built mental home in Vienna, Dr. Riedel, was very famous, and it was hoped that he could cure Semmelweis within a short time. But it is also very likely that the family, hoping for a speedy recovery, wanted to avoid the publicity arising from the fact that the professor of obstetrics had to be confined to a lunatic asylum.

The following day Mrs. Semmelweis visited the mental home, but dr. Riedel refused to let her see her husband on the grounds that Semmelweis's condition did not permit it [29].

In a statement made in 1906, Semmelweis's widow describes the incident in these words: "Next day we drove out, in the company of my uncle, to visit my husband in the mental home. Hofrath Riedel, director of the sanatorium, met us in person to say that the night before my husband had tried to get out and, when he was forcibly restrained, fell into a fit of delirium so that six attendants could scarcely hold him back. I was not allowed to see him."

Death

After a fortnight's confinement in the mental home, Semmelweis died at 11 a.m., August 13th, 1865.

The exact time of his death was not given unanimously either in the daily press-reports or by the various biographers. According to the *Medical Weekly*, the *Diary of Pest* and *Our Country* (*Hon*), Semmelweis died on August 14th. Störig believes that Semmelweis died in 1867 (!), and Ebstein states that he died on August 14th, and gives the place of his death wrongly as Döbling [30].

The exact time of his death can be ascertained from the obituary announcement issued by his family, and from the official death certificate.

Mrs. Ignác Semmelweis, née Irma Weidenhoffer and her children, Margit, Béla and little Antal, with deep sorrow announce the death of her husband, and their father, Dr. Ignácz Semmelveis, doctor of medicine and surgery, obstetrical master, professor of theoretical and



emmelveis Ignácznć, született **Weidenhoffer Irma**, maga és gyermekei: **Margit, Béla** és **Antalka** nevében mélyen elkesere dett szivvel jelenti elfelejthetlen férje s tekintve attyuk

SEMMELVEIS IGNÁCZ-nak

orvos-sebésztudor, szülészmester, és a pesti m. kir. tud. egyetemen az elméleti és gyakorlati szülészet ny. r. tanára

f. évi Augustus 13-án délelőtt 11 órakor tevékeny életének 47-ik évében agyhüdés következtében Bécsben történt gyászos kimultát.

A boldogultnak hült tetemei f. évi Augustus 15-én délutáni 5 órakor Bécsben ünnepélyesen beszenteltettek, és ugyan ott a Schmelzi sirkertben örök nyugalomra tétettek.

Az engesztelő szent mise áldozatok a pestbelvárosi plébánia templomban f. évi Augustus hó 23-kán reggeli 10 órakor fognak megtartatni.

Pesten, 1865 Augustus 16-án.

Marie Semmelveis, geborne **Weidenhoffer** gibt im ihrem, und im Namen ihrer Kinder **Margarethe, Adalbert** und **Antonie** mit betrübtem Herzen Nachricht von dem Ableben ihres unvergesslichen Gatten, und bezüglich Vaters

IGNATZ SEMMELVEIS

Dr. der Medicin und Chirurgie, Magister der Geburtshilfe, o. ö. Professor der theoretischen und praktischen Geburtshilfe an der kön. ung. Universität zu Pest,

welcher in Wien am 13. August l. J. Vormittags 11 Uhr, im 47. Jahre seines thätigen Lebens, in Folge eingetretener Gehirnlähmung selig im Herrn entschlafen ist.

Die entseelte Hülle des Verblichenen wurde am 15. August l. J. Nachmittags 5 Uhr in Wien feierlich eingesegnet und ebendort auf dem Schmelzer Friedhofe zur ewigen Ruhe bestattet.

Die heiligen Seelenmessen werden Mittwoch am 23. d. M. um 10 Uhr in der Pfarrkirche der Innerenstadt abgehalten.

Pest, 16. August 1865.

Obituary notice of the Semmelweis family

practical obstetrics in the Royal Hungarian University of Sciences of Pest. He died of paralysis of the brain, in the 47th year of life in Vienna, at 11 a.m., August 13th, 1865.

The holy ceremony over his body was held at 5 p.m., August 15th of the current year in Vienna, and his remainings were interred on the same day in the Schmelz-cemetery.

A requiem mass will be held in the City Parish Church of Pest, at 10 a.m., August 23rd. — Pest, August 16th, 1865.

The hospital record registers paralysis of the brain (*Gehirnlähmung*) as the cause of Semmelweis's death. As we have seen above, the obituary announcement sent out by his family repeated this as the cause of death. In point of fact, Semmelweis's death was not the result of insanity or any other mental trouble, its immediate cause was pyaemia, as can be clearly seen from the autopsy record to be discussed below.

Győry believes that when Semmelweis entered the hospital he had a hardly noticeable wound on the middle finger of his right hand, apparently the result of a gynaecological operation. Pyaemia resulted from that wound. Jung also repeats that it only became apparent in the mental hospital that Semmelweis was suffering from some kind of infection [31].

As far as the wound is concerned, opinions differ considerably. Fleischer makes no mention of it, Hegar speaks of pyaemia, Bruck on the other hand believes that, before his health had broken down, Semmelweis had operated on a newly born infant, in the course of which he had wounded the middle finger of his right hand, which in due course became gangrenous, giving rise to pyaemia. The same was confirmed by Grosse in 1898. Schürer von Waldheim only adds that the wound was inflicted by Semmelweis while performing a gynaecological operation. *Wiener Medizinische Presse* when reporting on the death of Semmelweis, wrote the following: " . . . he died from pyaemia, apparently resulting from a wound he inflicted on himself during one of his recent operations" [32].

We have no available information about the two weeks between Mrs. Semmelweis's unsuccessful attempt to visit her husband and his death. We do not know anything about his ordeals, physical and spiritual, and we can only hope that he did not lose hope in the final triumph of his doctrine.

The periodical *Medical Practice* published an unsigned article with the title "The Legend of Semmelweis's Death" in 1906. Using verbal information received from Prof. Béla Machik (1830–1879) of Kolozsvár University, the writer seems to allege that the pyaemia which caused Semmelweis's death had resulted from injuries on his lower arm due to the straps which bound him to the bed in his fits of delirium. The writer continues to deny the myth which had often been repeated at the Semmelweis memorial meetings, namely that his death was the result of pyaemia caused by a wound inflicted on himself during an operation. Dr. Béla Machik, who also died young, meeting a tragic end, had been an assistant in the mental home at Prindelfeld, working in the department where Semmelweis was confined. To the best of his knowledge, and he did not conceal it from his friends, the gangrenous wound which caused Semmelweis's death had nothing to do with an operation. The director of the asylum, Dr. Riedel, a former schoolmate of Semmelweis, had been on leave when the latter was admitted. When he returned, Dr. Machik reported on the condition of his unfortunate patient. Without changing his clothes, Dr. Riedel hurried to see his friend, who in a fit of excitement fell on him, hitting him in the face. According to the custom of the time, he was pinned down, put into a straight-jacket and bound to his bed with straps. When he was released days later his lower arm to which the straps had been bound became gangrenous. This caused sepsis, and death followed quickly [33].

Referring to the article in *Medical Practice*, Győry made the following observation: "At the present moment it would be hard to say which theory should be regarded as a 'myth'. Nobody can decide whether it was the wound inflicted at an operation that became gangrenous and caused pyaemia (*Medical Practice* calls it sepsis), finally resulting in Semmelweis's death. Either one or the other may be true, but it is also possible that both contributed to his end. When I formed my theory I not only considered prevalent views, but I also consulted the surviving acquaintances of the great man. To be sure, none of us, neither I nor his family and friends, can produce any authentic evidence that the self-inflicted wound

caused the death of Semmelweis. Nor can the writer of the article refer to anything but hearsay to prove his dreadful story, and there is no authentic evidence to convince the editor of *Medical Practice* that the alleged theory has any foundation" [34].

After Győry published his statement, *Medical Practice* continued to insist that what had been alleged was true, quoting the particulars of the autopsy document, according to which "not only the finger allegedly wounded during an operation was gangrenous, but there was a 'septic cyst' on the the finger of the other hand, a deep abscess on the elbow-joint due to necrosis, and signs of injury on the legs".

As seen on the obituary announcement sent out by his family, Semmelweis was buried 5 p.m., August 15th, 1865, straight from the mortuary of the General Hospital of Vienna.

The *Medical Weekly*, which gave the wrong date of Semmelweis's death, was also mistaken as far as the time of the funeral was concerned: "The late Professor Semmelweis's funeral was held in Vienna on August 16th. He had gone there on July 20th, and was buried in the Schmelz-cemetery." Actually, the date of the journey was July 31st, Semmelweis died on August 13th and was buried on the 15th.

Contemporary Obituary Notices

Markusovszky informed the readers of the *Medical Weekly* about the funeral in the following terms: "The funeral ceremony was held in the General Hospital where Semmelweis had begun his researches as the enthusiastic student of Rokitansky and Skoda, where he first acted as first assistant, later as lecturer of obstetrics and *Privat-docent*. Most of the resident professors of medicine in Vienna attended the ceremony, among others Rokitansky, Tivadar Helmet, Dr. Riedel, Károly and Gusztáv Braun, Prof. Späth (the last three as professors of obstetrics), Voigt, Standhartner, Joffe, Endlicher, and many others. As far as the findings of the autopsy, which we shall have the honour to publish in full in a later number are concerned, so much can be disclosed at this juncture: "The meninges showed signs of chronic hyperaemia, besides atrophy of the brain and chronic hydrocephalic symptoms, there were signs of acute inflammation in the brain and spinal marrow. The middle finger of the right hand was necrotic, metastatic abscesses were found in the limbs and in the left kidney; consequently the progress of pyaemia resulted in sudden death" [35].

It is remarkable that the obituary notices giving the list of those present do not make any mention of either Hebra or Skoda. It is possible that because of the vacations neither was in Vienna and were prevented from attending the funeral. It is very likely that Markusovszky had not without reason emphasized that "those resident in Vienna" had attended.

There were hardly any notices of Semmelweis's death in the daily papers or the foreign professional journals.

The Hungarian *Pester Lloyd*, in No. 187, 1865, reported in 20 lines on the death of Semmelweis, mainly quoting from the notice of the *Fremdenblatt* of Vienna [36]. It is typical that the *Fremdenblatt* stated wrongly that Semmelweis died in the private lunatic asylum of Döbling. The *Diary of Pest* had nothing more to record than: "From private sources it has reached us that Dr. Semmelweis, university professor of Pest, died yesterday morning in Vienna. Let him rest in peace (August 15th, 1865)." The paper *Our Country* published a brief notice in its August 15th, 1865 number, so did *Witness of our Times* (*Idők Tanúja*) on August 16th, and *Hungarian Press* (*Magyar Sajtó*) on August 18th.

Medical Practice recorded the death of Semmelweis in its "Miscellanies" column, briefly, without any comment: "Dr. Ignác Semmelweis, professor in our University of Sciences, who discovered one of the causes of puerperal fever, died in a lunatic asylum in Vienna of pyaemia on August 13th, 1865" [37].

The *Wiener Medizinische Presse* devoted two lines to one of the greatest benefactors of mankind (August 20th, 1865). Nor did the *British Medical Journal* (August 26th), or the *Wiener Medizinische Zeitung* (September 15th) devote more space to his memory.

The foreign medical press took very little notice of Semmelweis's death, with the exception of the *Wiener Medizinische Wochenschrift*. In No. 65, 1865 it reported: "Professor Semmelweis fell a victim to the disease he discovered just yesterday. Today we shall only devote a few lines to record the sorrowful event. Although we could not agree with the methods he used lately in connection with his colleagues, we have tried to be fair as far as the essence of his work and noble efforts are concerned." In its next number the periodical described the funeral, which according to its report many scholars, scientists and professors attended [38].

Markusovszky's Farewell

In the *Medical Weekly*, Markusovszky made his touching farewell to a devoted friend whose development he had watched, whose joys and sorrows he had shared. Markusovszky paid a worthy tribute to the personal greatness of Semmelweis. "The loss that our paper reports on its front page", Markusovszky wrote, "is as afflicting and irreparable, as the symptoms of the terrible disease which struck him down, in mature manhood, in the midst of zealous activity.

"When giving an account of the sad news of the illness of our distinguished late contributor, I was reluctant to give expression to the dreadful foreboding that it would be followed by something worse, yet the sudden end came too soon and was entirely unexpected.

"How unscrutable the ways of providence are that a man who devoted his untiring efforts to studying a disease and succeeded in saving millions of lives should have been visited by another shape of the same disease to cut short his life and extinguish his energy.

"The early death of Professor Semmelweis is not only an irreparable loss in our scientific life, but he will be difficult to replace in our obstetrical circles and at the university. He was one of those mortals not always happy, but he was favoured by fate, inasmuch as it was given him to enrich science with a new idea, thereby conferring upon humanity an immeasurably important service. And what still further enhances the service in this respect is the circumstance that his discovery was no mere stroke of luck but the result of a living conclusion and conviction, evolved from scientific observation and knowledge. — It would be impossible to doubt Professor Semmelweis's honesty and sincere love felt for humanity if we only consider his harsh treatment of his adversaries who, to his mind, failed to use his doctrine in the service of those in need of it. The writer of these lines can best stand up to proclaim the greatness of the man, because he saw him and watched him in his daily fight in the discovery of the cause of the devastating fever which had brought havoc in the obstetric clinic of Vienna since the days of Professor Boehr. He was convinced that he would find it, because he believed it to be a local circumstance, tangible and discoverable, and so it was.

"It is to be regretted that Professor Semmelweis was not able to train a school of expert obstetricians and gynaecologists so badly needed in Hungary. His expert knowledge and operative skill, his tact and judgement acquired through independent research, his ability to distinguish between the false and the true, the useful and the useless would have highly qualified him for this task. It is most deplorable that practical obstetrics did not become a compulsory subject during Semmelweis's professorship, although there is nobody who doubts its usefulness. Nor could he achieve, in spite of repeated appeals, that a gynaecological department should be founded, however useful it have proved to be in the University of Vienna.

"Professor Semmelweis was a frequent contributor to our medical literature, a founding member of our medical publishing house, and an active supporter of our periodical. It would have been a noble task for him to complete the textbook of Hungarian obstetrics, and the handbook of gynaecology, in both of which he had been busily engaged. Death has unfortunately put an end to the promising activity, and to other hopes and aspirations.

"We do not feel quite competent to discuss the scientific merits of a man of his calibre, yet it would be unfair not to speak of his upright, honest nature, of his feeling heart, and his goodwill to all men, although his manners may not always have been smooth and balanced. His weaknesses were deeply rooted in his virtues: he could fight and defend a good cause but he could just as violently oppose what he believed to be wrong and harmful to science. No one can doubt the highly moral aspect of his motives, although they may have appeared at times strange owing to his sufferings, yet their lofty aim and purport were always warranted. Professor Semmelweis was an upright, natural man, and it was impossible for him to be anything else. Egotism and cringing were equally foreign to his noble soul: he was a loyal friend and colleague, he was lavishing in his sympathy, advice, and respect for those whom he considered worthy to be his friends, disciples and col-

laborators. He had no other purpose in life but to serve science, and he was always ready for any sacrifice. He supported our university with the same enthusiasm, doing his utmost in whatever was expected of him as a human being, physician, teacher and citizen.

"We all are concerned in this loss, yet those who felt the warmth of the departed soul will be deeply afflicted and will find no consolation for many a day to come" [39].

György Schopper, the retiring rector of Pest University, who had reported to the Presidential Council (No. 1 138/1865, August 19th, 1865) on the death of Semmelweis in Vienna on August 13th, 1865, as the result of paralysis of the brain [40], said, among other things, the following in a memorial speech held on September 30th, 1865: " . . . The loss of this man has not only been heart-rending to his friends in the university, but has caused painful distress and mental suffering. It would be useless and futile for me to explain to this gathering the worth and merit of the teachings of the late Ignác Semmelweis, doctor of medicine and surgery, master of obstetrics, professor of theoretical and practical midwifery who, after ten years of fruitful and untiring activity, was deprived of his senses by the inscrutable will of Our Father and soon after his earthly sufferings, full to the brim, ended. His sudden death was unexpected to us all, the loss being all the more unbearable. His death is mourned not only by our university, and by our twin-town capital, but also by the whole country. We are mourning the death of a faithful colleague, the pride of our university, and the departure of an untiring researcher, the saviour of women, the best of friends and a devoted relative. May his all-suffering soul, deprived of its senses, rest in the eternal peace of the truth of the universe . . ." [41].

In the name of the Medical Society of Pest–Buda, at a session on October 14th, 1865, Sándor Lumnitzer said the following touching words in memory of Semmelweis: " . . . We deeply grieve . . . the sudden and unexpected death of our fellow-member, Ignác Semmelweis. His active life, his great scholarship, his resourceful spirit and fruitful ideas have won the admiration of his immediate friends, but have also erected a historical monument in the world of medical science" [42].

Did Semmelweis Suffer from an Organic Disease of the Brain?

From the above it has become evident that Semmelweis did not suffer from chronic insanity. Now we shall discuss another moot point often raised: Did Semmelweis ever suffer from any organic mental trouble? In the Semmelweis literature we often meet with the view that Semmelweis's complaints were the result of organic trouble. Apart from a good many other grounds, this view was, to a large extent, based on the autopsy record published in the November 25th, 1865 issue of the *Medical Weekly*.

The post mortem examination was performed in the pathological department of the General Hospital of Vienna by Gusztáv Scheuthauer (1832–1894), later Professor of Pathology in Budapest University, and *Privat-docent* Th. H. Meynert (1833–1892) then prosector of the Lower-Austrian Mental Home and from 1870 Professor in the University of Vienna [43].

Markusovszky published the autopsy record signed by Scheuthauer with the following remark: "We hope that, because of the high pathological standard of this record, with regard to the disease from which our great scientist died, it will be of interest not only to the friends of the deceased but to all lovers of scientific research" [44].

Post mortem examination of the late Ignác Semmelweis

(The first part contains the description of the general examination as follows.)

The body is middle-sized, well developed, pale-yellow. There are greyish-red spots on the back and on sides of the extremities. Hair grey, the pupils are small. The neck is thick, the chest is convex. On the left side over the major pectoral muscle the skin is dirty-green and swollen. The abdomen is flattened. The last joint of the right middle finger, the top of the second joint and a little part of the first are partly denudated and dirty, partly covered with small pieces of tissue. The last interphalangeal article is opened and devoid of its cartilaginous surface. At the top of the right elbow there is a deep, purulently inflammated loss of tissue which lies upon the periosteum. On the left arm, and beside the lateral epicondylus of the knee there is also some loss of tissue. The 1st interphalangeal article of the left second finger is also swollen.

The calvaria is massive and its wall is thick, the dura mater is closely adherent. Hyperaemia in the leptomeninges which are swollen and along the dilatated blood vessels cloudy, adhering to the cortical substance. The gyri of the frontal cortex are thin. The cut-surface—especially in the grey part—shows hyperaemia and is moderately moist. In the ventricles there is some clear fluid, the ependyma is somewhat thickened. The septum is broken and soft in places. In the left median cranial fossa there are bean-sized greyish-green pseudomembranes.

The thyroid gland is firm, containing some colloid. In the trachea there is some fluid and the mucous membrane is pale.

The left costal arch is bigger, with a nut-sized focus located in the subdermal connective tissue. Between the major and minor pectoral muscles there are yellow, gangrenous cavities causing putrid infiltration of these muscles as well as of the intercostal muscles. There are similar changes in the periosteum of the Ist-VIth ribs; the IIIrd intercostal muscle and the parietal pleura are perforated. Corresponding to this perforation, in the pleural cavity there is a fist-sized gangrenous hollow, which is bordered by the arch of the costal arch, the visceral pleura and the pericardium. The left lung is comprimated and free at this place, whereas at the other parts there are filamentous adhesions. Between the pleural membranes at the back part of the right lung there is a massive adhesion. Both lungs are oedematous and moderately hyperaemic.

In the pericardial sack there is some red serous fluid. The heart is large, loose, the myocardium is pale red, there is diluted blood in the heart.

The liver is firm, pale, yellow bile in the gall-bladder, the spleen is brownish-red and firm.

The stomach and bowels are moderately dilatated. The mucous membrane of the stomach at the fundus is slightly softened, there are nipple-like prominences at the pylorus. The mucous membrane of the bowels is pale and in their hollow there is bilious excrement. In the left

kidney there are abscesses, surrounded by an inflammatory zone. In the bladder there is some clear urine.

The posterior column of the spinal cord became a greyish-red mass, the other parts are oedematous.

The diagnosis, based upon the necropsy findings, refers to the organic change of the central nervous system:

Hyperaemia meningum, hyperaemia et atrophia cerebri cum hydrocephalo chronico. Degeneratio grisea medullae spinalis. Gangraena digiti medii manus dextrae articulationem ejus interphalangeam ultimam perforans. Metastases in tela cellulosa subcutanea extremitatum et abscessus metastaticus inter musculum pectoralem majorem et minorem sinistrum, thoracem perforans, subsequente pyopneumothorace sinistro circumscripto [45].

The cause of death: phlebitis, lymphangitis, pleuritis, pericarditis, encephalitis.

(*In the second part of the necropsy description we can find the histological examination of the brain and of the spinal cord.*)

Finally there is a summary stating that Extensive hyperaemia in the brain, perivascular cell proliferation, demyelinization and increasing of connective tissue, gliosis in the cortex and the degeneration of the ganglion cells in the deeper layers. Similarly there is also hyperaemia, in the leptomeninges fatty degeneration and cell proliferation in the vascular walls and around them.

In the spinal cord hyperaemia and fatty degeneration, oedema and demyelinization, especially in the posterior column [46].

The majority of those who believed that Semmelweis suffered from an organic disease of the brain called it paralysis. In his obituary notice on Jakab Bruck, R. Temesváry made the following statement: "what a strange and tragic irony of fate that Semmelweis, like József Fleischer and Jakab Bruck, spent the last years of his life in the dreadful clutches of progressive paralysis (*paralysis progressiva*)" [47]. The same author in a paper: "A Few Pages from the History of Gynaecology in Hungary during the Past Fifty Years" says: "Fleischer held his in memoriam speech of Semmelweis who died in dementia only to follow him within a short time. His memorial speech was made by Jakab Bruck" [48]. Gyula Magyary Kossa also believed that Semmelweis died of paralysis [49].

Also Georg Sticker was convinced that the early death of Semmelweis was the result of an organic brain trouble and disease of the spinal marrow, though he did not consider the available particulars convincing enough and went to Vienna to check them in person. "We can hardly admit today," wrote Sticker in 1924, "that disappointment for being unrecognized, malice, neglect and persecution could cause an organic disease of the brain and spine forcing the sufferer to be confined to a lunatic asylum and die soon after. I have discussed the matter with Konrad Rieger, and it seems that it would be worth while to find out exactly what embittered Semmelweis's life, what brought it to an early close, and what had in fact caused his death. I had hoped that my stay in Vienna would bring me closer to a solution as far as the case history and the post mortem record are concerned. My colleague, Izidor Fischer, obtained for me from the Institute of Pathology a copy of the letter, which corresponds exactly to what was published by the *Medical Weekly*. In their respective biographies Jakab Bruck (1887) and Schürer von Waldheim (1905) have added important data to the case history which had not been taken into consideration so far. The signs of progressing brain trouble,

Semmelweis's uncertainty in his latter years, the constricted pupils of the cadaver, grey degeneration of the spinal cord established by the psychiatrist-prosector Meybert are quite sufficient for a diagnosis" [50].

Following Sticker, Franz Bruck explicitly stated in 1929 that Semmelweis suffered from tabo-paralysis, ruining his life physically and mentally in his last years [51].

In his medico-historical book, Paul Diepgen speaks of Semmelweis's endogenous insanity, on account of which he had to be confined to a lunatic asylum [52].

Percy M. Dawson [53] also speaks of an organic disease of the brain, which is fully endorsed by G. A. Wagner, Professor of Obstetrics in Berlin. The latter insists that Semmelweis's insanity was evident when he produced his great book (1857–1860). Disappointment because of the neglect of his doctrine had caused the breakdown of his health, but the post mortem examination confirms an organic disease [54].

Creutz and Streudel mentioned above also speak of an organic disease, specifically of paralysis: "It was most unfortunate that Semmelweis had become a paralytic before his doctrine could be generally recognized. It is more than likely that the last section of his book, and the Open Letters with their static arguments, stereotype repetitions and strange mortality statistics, bear the imprint of his condition. His violent attacks on contemporary medical science also point to the fateful deterioration of his condition. In the summer of 1865 he was so ill that he had to be taken to a lunatic asylum in Vienna" [55].

Last year saw the publication of a book written by István Benedek, entitled *Semmelweis and his Age* (1967). The writer sums up his view concerning the mental process of Semmelweis's illness in the following words: "There are three entirely interdependent phases in the mental illness of Semmelweis. The first phase, that of psychopathia, culminated around 1861 but never developed into insanity. The second phase of chronic degeneration of the nervous system, probably paralysis, progressed in gradual stages from 1861 onwards and became acute in the summer of 1865. The third phase was brought about by an acute infectious mental disturbance due to osteomyelitis with which he was affected in the mental hospital in Vienna. His death was caused by pyaemia" [56].

As can clearly be seen from the above quotations, the accepted view in the literature seems that Semmelweis suffered from an organic disease of the brain. Recent research however has revealed certain facts which clearly show that these views must be rejected.

There is no doubt that the contemporaries as well as the biographers have been seriously influenced by the circumstance that, in the last few weeks of his life, Semmelweis suffered from mental disturbance, and that he was taken to a mental hospital, where he died. Although many contemporaries, first among these Markusovszky, stated on the evidence of the post mortem examination published in the *Medical Weekly* that the immediate cause of Semmelweis's death was not insanity but pyaemia, nobody has taken any notice of it. The mental hospital had given as the cause of death paralysis of the brain (*Gehirnlähmung*), and this was repeated

in the death certificate issued by the General Hospital of Vienna, and by his family in their obituary announcement.

The general belief that Semmelweis suffered from an organic disease of the brain was greatly supported by the autopsy report which, in its diagnosis, clearly speaks of *atrophia cerebri* and *hydrocephalus chronicus* [57].

It is also evident that, in the last few years of his life, there was a distinct change in Semmelweis's personality. The man, who before had been of a happy, open-minded and well-balanced disposition, suddenly became morose, moody, with a bent to instability and eccentricity in his behaviour. These circumstances had not escaped the notice of some contemporaries, among them Kálmán Müller, and naturally his wife.

We have repeatedly emphasized the most potent evidence that apart from the last few weeks, Semmelweis was entirely sane: Until his acute mental breakdown in July 1865, Semmelweis had fulfilled functions—professional, scientific, social—to the satisfaction of all. He managed his clinic, he gave lectures and performed the duties of economic superintendent in the medical faculty. It is evident that, if the symptoms of insanity had been present, neither his colleagues nor his university would have shown the "forbearance" insisted on by Sinclair, but they would have relieved him at least of his office as economic superintendent. His last scientific contribution "Operative Treatment of the Ovary" had appeared in parts, and only remained unfinished because of his death. Yet the last part came out on July 18th, 1865 in the *Medical Weekly*. The paper follows a logical pattern and is written in the most careful style. It could not possibly have been the work of a man with a deranged mind.

Most of the contemporaries repeatedly declare that the symptoms of his "insanity" became evident only in the last weeks of his life. In his diary Ignác Hirschler confirms that Semmelweis's "insanity had produced symptoms only in the last weeks of his life" [58]. Let us recall again Fleischer, who in his memorial speech in 1872 discussed his superior's illness in the following terms: "In the last weeks of his life, his deep, perspicacious, clear mind became deranged." Gy. Schopper, rector of the university, also emphasized in his speech that Semmelweis "had devoted ten years of hard and successful work" to this institution. From Markusovszky's moving farewell article, one cannot do anything else but clearly see that, apart from the last few weeks, there was no change in Semmelweis's behaviour.

We must insist on the point that before July 1865 nobody had ever spoken of Semmelweis's "insanity", it only emerged after it had become known that he had been taken to a lunatic asylum where he finished his life.

Károly Schaffer, Professor of Psychiatry in the University of Budapest, attempted to approach Semmelweis's "insanity" from his own particular point of view. He insisted that Semmelweis's mental trouble was a so-called secondary (and not a genuine) symptom of endocrine functions, and it was mainly due to psychological tensions he had endured during his life. Schaffer did not deny the possibility of paralysis, in fact he even makes the reader assume that it existed in Semmel-

weis's case. He also left the question open whether Semmelweis's evident mental derangement before his death could have had any connection with pyaemia from which he died. Schaffer's deductions were "Kretschmerian" and, according to Nyirő, are no longer tenable from the point of view of modern psychiatry [59].

Statements by Regöly-Mérei, Haranghy and Nyirő

In order to form a correct judgement in this question, the research work of Regöly-Mérei, Haranghy and Nyirő are of paramount importance.

In studying the life and activities of Semmelweis the medical historian Gyula Regöly-Mérei did not discover one single factor pointing to insanity. Until his feverish, septic state in the summer of 1865, Semmelweis had pursued his activities without failing both as a scientist and as a physician. He explains the psychic symptoms evident before Semmelweis's death as being the feverish, septic condition of delirium [60].

Regöly-Mérei's view concerning a state of feverish delirium has not been corroborated by the evidence at our disposal. None of the contemporaries, including Semmelweis's wife and the attending physicians, had ever spoken of such a condition. His view may however be tenable without the existence of the feverish delirium state. There are mental disturbances which come about resulting from infection which, in the period of incubation, do not always cause fever and other symptoms (Nyirő).

Quite recently certain data have become available which seem to prove that the feverish state had *de facto* existed. In the current year Semmelweis's remains have been exhumed and the skeleton examined by Dr. Gy. Regöly-Mérei and Dr. L. Bartucz at the Second Institute of Pathological Anatomy under Prof. L. Haranghy. The authors of this book have been authorized by Prof. Haranghy and the other examiners to make use of certain data before they publish their own findings: The bones have revealed to the examiners the picture of a grave osteomyelitis which must have been responsible for the infection that caused death. According to Regöly-Mérei and Haranghy the process may have lasted for weeks not only ten days, and the septic condition must have existed when the symptoms of acute insanity appeared.

Prof. Haranghy has compared the original autopsy record in the archives of the former Rokitansky Institute, placed at his disposal by Hans Chiari, Professor of Pathological Anatomy in Vienna University, with the one published in the *Medical Weekly* by Markusovszky and signed by Scheuthauer. The comparison revealed that "the two versions were almost identical but, in connection with the spinal cord, the Hungarian version does not agree with the original, as it contains certain parts that are missing from the original; the text of the diagnosis does not entirely agree either". Comparing the histological findings with the original autopsy report, he concluded that the latter contained nothing from which the

symptoms of progressive paralysis might have been conjectured. Slight sclerosis of the brain was detectable in addition to the acute hyperaemia of the cerebrum, the spine and meninges, which must be regarded as partial symptoms of pyaemia.

"Studying the autopsy record of Semmelweis", comments Haranghy, "it has become obvious that the symptoms—as described by Meynert—are not tabetic but that they correspond to the acute swelling of the spinal marrow." He continues by stating: "It is very strange that the autopsy diagnosis of the *Medical Weekly* speaks of *atrophia cerebri cum hydrocephalo chronico*, whereas the original contains nothing of the sort."

It should be worth recording that Sticker, who also compared the autopsy record published by the *Medical Weekly* with the original preserved in the Institute for Pathology in Vienna, only states that the autopsy record agrees with the original, but does not extend this to the diagnosis ("*. . . stimmt mit dem in O.H. veröffentlichten Protokoll über den Leichenbefund überein*").

Haranghy summed up his view as follows: "Neither the autopsy record nor the neuro-histological changes can offer convincing proof that Semmelweis suffered either from paralysis or tabes, and as far as it is possible to draw conclusions regarding psychic conditions from pathological findings, it is possible to presume that the disturbed mental state *prae mortem* was caused by the clearly demonstrable septic state responsible for his delirial condition . . . As far as the chronic changes in the brain are concerned, they need not be explained as tabetic or paralytic symptoms, but can be due to the sclerotic condition of the vessels of the brain."

It is difficult to explain why and how the *Medical Weekly* came to introduce *atrophia cerebri cum hydrocephalo chronico* into the text when it is not to be found in the original [61].

Prof. Nyirő gave a thorough analysis of the mental state of Semmelweis, and in his study he devoted much space to the question of paralysis. With reference to Haranghy's data, he explicitly stated that pathological and neuro-histological findings cannot be conclusive to the diagnosis of paralysis and tabes. He commented as follows: "It being impossible from the pathological findings to diagnose paralysis, we have to investigate additional mental phenomena which could explain the presence of paralysis. Owing to the fact that a few weeks before his death Semmelweis had developed mental symptoms, his enemies turned his psychic condition to their advantage and made his illness responsible for the violent tone he used in the course of his struggles. We know today that paralysis has no classical psycho-pathologic symptoms because progressive dementia hardly ever occurs. In those days however it was considered as the cardinal symptom (*Kardinalsymptome*). If we study Semmelweis's case from the point of view of dementia, we can state that the symptom of gradually degenerating intellectual activity did not arise at all."

In order to prove his point, Nyirő enumerates Semmelweis's many-sided activities which he carried on almost until his death and he concludes: "As a sign of his supposed dementia, it is counted to his discredit that his monograph published

in 1861 contained many repetitions, personal abuse, and that the letter addressed to all the professors of obstetrics was rude to the extreme . . . Perseverance (the constant repetition of the same thought) can occur in a sane condition too, especially if one is passionately defending a view of vast importance which has not met with recognition and understanding. That passion can choose an aggressive tone may clearly be observed in the instance of Ramón y Cajal, a psychologically balanced person who in a scientific contribution called István Apáthy a fraud, simply because the latter did not share his view.

"Semmelweis's widow, in an advanced age, about 40 years after the death of her husband, expressed the opinion that she had observed a remarkable change in the personality of her deceased husband about four years previous to his death. Undoubtedly there are other symptoms, too, from which one can suppose pseudo-neurasthenia. On the evidence of Haranghy's view we may take it for granted that Semmelweis had developed the early symptoms of cerebral arteriosclerosis. It was responsible also for the symptoms of pseudo-neurasthenia, which on the other hand can by no means be identified with dementia."

Nyirő sums up his conclusions concerning paralysis in the following words: "From the surviving data one can state with certainty that Semmelweis suffered from a deliriant, amentiform mental disorder."

Then he discusses the clinical appearance of this mental condition of Semmelweis, as his hospital case history included the diagnosis of mania.

"In 1860 a manic state had been diagnosed in different ways. In those days it was believed that this state existed as one phase of maniaco-depressive psychosis. Others again considered any restless patient a maniac. Many authors regarded various forms of delusions, i.e. the paranoid mental disorders as manic. Remembering these views, we can state that, although Semmelweis showed symptoms of instability of mood, these can be explained as psychologically normal, and should by no means be regarded as morbid . . . Psycho-motoric restlessness that probably induced Semmelweis's attending physician to diagnose a manic state set in, in fact, 2–3 weeks before his death, and was evidently caused by infection.

"It is very likely that his contemporaries had considered Semmelweis as a chronic maniac, because he had ruthlessly attacked his adversaries who, on the other hand, had been just as ruthless with him in the heat of the battle. Semmelweis also used unconventional expressions. We must suspect that by being called a maniac he was assumed to have suffered from paranoid insanity. When we watch closely Semmelweis's struggle for recognition we can certainly discover the symptoms of excessive activity, excitement and a vehement condition observable in querulous paranoia.

"The question remains to be answered whether we can assume that Semmelweis had actually been obsessed by delusions, since insistance on one's rights is not necessarily a paranoid feature. Delusions are always concerned with the Ego, exaggerated in a positive or negative manner by the paranoic. Semmelweis did not over-estimate himself to the slightest degree . . . He highly esteemed his discovery which he regarded as a simple, incontestable fact, but he never attached

importance to his own person. Who can wonder then that he used bad language when faced with the metaphysical views of his adversaries who refused to recognize his doctrine which was based on the simplest scientific facts. It naturally increased his violence that a scientist of the caliber of Virchow should have remained blind to his teachings. As that was not a delusion, how can we consider him a paranoic?

"It should also be remembered that the discovery had produced a peculiar change in the personality of Semmelweis which is generally expansive. He became filled with emotional tension and he used up all his energy so that his teachings should be recognized; meeting with ill success he became impatient and irritated. At the same time, he continued with unceasing energy to devote all his efforts to saving the lives of childbearing women, which was the main point of his discovery. This accounts for his persevering manner of frequently repeating his point, and for his strong emotion when met with rebuff in the question of puerperal fever, etc. Certain individuals, under the stress of conflicts, develop an expansive personality, which alone is not yet a morbid feature. These personalities, on the other hand, are more obstinate than the average type of man, more persevering, with a relatively excessive amount of activity. In morbid cases it is coupled with the overestimation of the Ego which, in Semmelweis's instance, did not exist at all. It is evident that in the case of Semmelweis not even a chronic manic state with a paranoid background can be postulated."

Nyirő summed up his conclusions in these words: "With reference to the above, I can clearly state that Semmelweis did not suffer from any form of chronic insanity, paralysis, mania or paranoia. His peculiar change in personality made him become fanatic in his discovery. It was also reflected in a pattern of behaviour which is not uncommon in genius. It is most likely that the pseudo-neurasthenic symptoms that had preceded his acute psychosis had arisen from cerebral arteriosclerosis, which, in the initial stages, had not affected his intellectual activity. There is no doubt that the acute psychosis three weeks before his death was an exogenous, reaction type mental disorder resulting from the sepsis which finally caused his death. Had Semmelweis recovered of the sepsis he would have been cured of his mental disease too" [62].

The researches of Regöly-Mérei, Haranghy and Nyirő have thrown new light on the question of Semmelweis's "insanity".

Notes

1. Egy régi medicus emlékeiböl (From the Recollections of a Former Medical Student). *Gyógyászat (Medical Practice)* (1890) p. 324.
2. The Medical Meetings in St. Petersburg. *OH* (1863) pp. 105–110.
3. F. Pachner: *Za Zivoty Matek. I. F. Semmelweis* (*For the Lives of Mothers*). (Prague, 1959) p. 190.
4. R. Creutz and E. G. J. Steudel, *Einführung in die Geschichte der Medizin.* (Iserlohn, 1948) pp. 290–291.
5. Schürer von Waldheim, Semmelweis. *Aerztliche Reform Zeitung* (1907) pp. 16–17.

6. "*Es ist tragisch, dass der überraschend logiscn veranlagte Mann, einer Geisteskrankheit verfiel. Solche Krankheiten pflegen nicht mit einem Male einzusetzen, sondern sich langsam zu entwickeln und gerade den Nahestehenden zuletzt zum Bewusstsein zu kommen. Allmählich stellte sich eine auffallende Vergesslichkeit ein, zweitens grösste Aufregung, in denen er keinen Widerspruch vertragen konnte, wechselten mit einer auffallenden Depression und Melancholie. Bis zum Juli 1865 war er noch im Stande seinen Obligenheiten nachzukommen.*" Die 50-jährige Gedenkfeier der Semmelweis'schen Entdeckung. Eröffnungsrede gewidmet dem Andenken Semmelweis. *Verhandlungen der Deutschen Gesellschaft f. Gyn.* (Leipzig, 1897) pp. 5–30.
7. G. Th. Gram, *A Biographical Sketch of I. Ph. Semmelweis Commemorating the Antiseptic Method* (Philadelphia, 1898).
8. "*Von dem Moment, in welchem er sich einer grösseren schriftstellerischen Thätigkeit hingegeben hatte, war seine geistige Erregtheit gestiegen. Ein pathologisch erhöhter Trieb zum Schreiben machte sich geltend so dass dem grössern Werk rasch hinter einander die viel besprochenen offenen Briefe an v. Siebold, Scanzoni, Späth, an sämmtliche Professoren der Geburtshilfe folgten. Das Ungezügelte der darin enthaltenen Polemik, die Wahl unpassender Ausdrücke, der Gebrauch von Schimpfwörtern, die steten Wiederholungen deuten schon auf eine abnormale Thätigkeit der psychischen Organe. Auf der Strasse machte Semmelweis (!) Propagande für seine Lehre und suchte dieselbe mit lauten Demonstrationen auch im Kreise von Laien zu verbreiten. Sein sonderbares, nicht zu berechnendes Benehmen, seine Zerstreutheit und Vergesslichkeit fingen an aufzufallen. Mit dem Stadium der Aufregung, eines heftigen keinen Wiederspruch duldenden Wesens, wechselten Zustände der Depression und melancholischer Stimmung. Später bemerkte man selbst ein kindisches Wesen, auffallende Gefrässigkeit, Neigung zu obscönen Redensarten, hochgradig gesteigerte Sinnlichkeit. Die Erkrankung hatte im Anfang sehr langsame Fortschritte gemacht, so dass seine Umgebung, und Freunde noch lange Zeit das Gefahrvolle seines Zustandes nicht vollständig erkannten. Auch war Semmelweis (!) noch im Stande, bis zum Sommer 1865, seinen Amt und Beruf nachzugehen. Dann machte das Leiden jedoch so rasche Fortschritte und das Benehmen des Kranken wurde ein solches, dass man gezwungen war, ihn in die Irrenanstalt nach Wien zu herbringen.*" Cf. A. Hegar, *I. Ph. Semmelweis.* (Freiburg, 1882) pp. 34–35.
9. T. Kézmárszky, *A szülészet könyve* (*Textbook of Obstetrics*). (Budapest, 1904) p. 676.
10. *Nemzetközi Semmelweis emlék* (*International Semmelweis Memorial Volume*). Ed. by Gusztáv Dirner (Budapest, 1909) p. 111; O. Pertik, *In Memoriam Semmelweis* (*Memorial Speech*). (Budapest, 1911) p. 15.
11. V. Robinson, Pathfinders in Medicine. *Medical Review of Reviews, New York* (1912) pp. 232–246.
12. R. Major, *A History of Medicine.* (Springfield, 1954). vols I–II.
13. J. A. Daly, Semmelweis. Discoverer of the Cause of Puerperal Fever. *Atlantic Medical Journal* (1926) p. 417.
14. K. Burger, Semmelweis élete és tana (The Life and Teaching of Semmelweis). *Budapesti Orvosi Újság* (*Budapest Medical News*) (1931) pp. 417–420. Semmelweis, His Life and Doctrine. *Cyclopaedia of Medicine by Sajous* (Philadelphia, 1931).
15. M. Zeissl, Erinnerungen aus der Semmelweis-Zeit. *Wiener Med. Wschr.* (1918) pp. 1205–1206.
16. E. Ebstein, *Memoiren aus vier Jahrhunderten* (Berlin, 1923) p. 406; G. J. Vanrell, *Rev. Esp. de Obst. Gyn. Madrid* (1950) pp. 389–401.
17. Interview with Semmelweis's Widow. *Magyar Hirlap*, Oct. 2nd, 1906.
18. Sinclair, op. cit. p. 267.
19. About 40 of Semmelweis's letters written to the Presidential Council on economic affairs of the medical faculty have been carefully studied in the national Archives. Although they were not written in his hand and did not require any mental effort, they still can serve as evidence of his perfect sanity up to a few weeks before his death in spite of his moodiness, nervous tension and strange behaviour.

20. Bäcker, Semmelweis emlékezete (In Memoriam Semmelweis). Semmelweis lecture read before the Medical Association of Public Hospitals of Budapest. Cf. *Gyógyászat* (*Medical Practice*) (1919) pp. 1–3, 4–8, 21–23, 36–38.
21. T. Győry, Remarques sur les derniers jours de Semmelweis. *Presse Médicale* (1925) pp. 1531–1532.
22. Klara Schreiber, Noch ein Wort über Semmelweis. *Neue Freie Presse*, Vienna, January 6th, 1904.
23. J. Fleischer, Emlékbeszéd Semmelweis Ignác tana felett (Memorial Speech). *OH* (1872) pp. 775–786.
24. Kálmán Müller's Memorial Speech on Frigyes Korányi, in 1913. *Medical Society Yearbook*, (1913); idem, *Az orvostudomány magyar mesterei* (*The Hungarian Masters of Medical Science*). (Budapest, 1924) pp. 23–24.
25. Gy. Korbuly, Semmelweis utolsó napjai (The Last Days of Semmelweis). *OH* (1940) pp. 436–441.
26. Navratil, Báthory István Nekrológ (István Báthory. Obituary). *OH* (1901) p. 23.
27. Nieder-Österreichische Landes-Irrenheil- und Pflege Anstalt, Vienna IX, Lazareth Street 14. Emanuel Mildner (1814–1881) was head of one of the departments; later he also became director of a branch institution founded for incurable mental patients in 1870. The Lower-Austrian Mental Home only admitted patients in the possession of official certificates. "*Das Zeugniss, dass der aufzunehmende Kranke wirklich irrsinnig sei, welches von einem öffentlich angestellten oder in Ermanglung dessen von einem zu Praxis berechtigten Doktor der Medizin ausgestellt sein muss.*" Cf. *Wien's Heilung und Humanitätsanstalten, ihre Geschichte, Organisation und Statistik*. Ed. by Ludwig Wittelshöfer (Wien, 1856) p. 394; Nat. Arch., No. 66 235/1865: a Pres. Counc. report containing particulars of *Todesfalles-Aufnahme*, dated Vienna, Sept. 21st, 1865. In this document the date of the journey to Vienna is given as July 31st, 1865.
28. F. Schwarzer, *A budai magán elme- és ideggyógyintézet tudósítója és 12 évi működésének eredménye* (*Report on the Private Home for Mental and Nervous Patients in Buda and its Twelve-Year Practice*). (Buda, 1864).
29. Joseph Gottfried Riedel (1803–1870), director of a lunatic asylum in Prague, 1837–1853, then of the Lower-Austrian Mental Home (1853–1869). He was considered the best mental specialist in the Monarchy, well-known in Pest too, which he often visited to advise in the lengthy construction of Lipótmező Lunatic Asylum. "Dr. Riedel, director of the Vienna lunatic asylum, had been asked to make the plans for a similar institution to be built in Buda, and supervise building and equipment." *OH* (1857) p. 61.
30. The error that Semmelweis died in the Döbling lunatic asylum (*Dr. Jörgen's Privat Heilanstalt für Gemütskranke*) was due to an article in *Fremdenblatt*, August 16th, 1865, No. 228. It was taken over by J. Grosse, M. Zeissl, Hirsch, Guth and Puschmann. Győry, in a letter to the editor of *Wiener Klinische Rundschau*, had to state emphatically that Semmelweis had never been in Döbling and was admitted to the Lower-Austrian Mental Home. Cf. *Wien. Klin. Rundschau* (1906) p. 846.
31. P. Jung, Semmelweis. Zu seinem 100. Geburtstag. *Correspondenzblatt für Schweizer Aerzte* (*Basel*) (1918) pp. 1043–1048.
32. ". . . wahrscheinlich in Folge einer Verwundung, die er sich bei einer seiner letzten Operationen beigebracht, an Pyaemie starb." Cf. *Wiener Med. Presse*, Aug. 20th, 1865, No. 34.
33. *Gyógyászat* (*Medical Practice*) p. 681.
34. Ibid. (1906) pp. 699–700.
35. *OH* (1865) p. 554.
36. "*Der am 13. d. M. erfolgte Tod des Herrn Professor Dr. Ignaz Semmelweis,—schreibt uns einer unserer angesehensten Aerzte, ist nicht nur für unsere Universität ein grosser, schwer zu ersetzender Verlust, sondern auch für die medizinische Wissenschaft im Allge, meinen, welche der Verstorbene in der kompetentesten Weise repräsentierte. Professo-Semmelweis, einer der eifrigsten Schüler Rokitansky's, hatte sich schon als Assistent der*

geburtshilflichen Klinik in Wien 1846–1848 ein grosses Verdienst um die dortige Anstalt und die leidende Menschheit dadurch erworben, dass er die Ursache der deletären Puerperal-epidemien in Wien in der Infektion durch zersetzte animalische Stoffe nachwies, und auch die Mittel, um diesem Übel vorzugehen, angab. Diesen glücklichen Gedanken seiner Jugend verfolgte er auch als Mann mit unerbittlicher Strenge eben so sehr wie mit dem Feuereifer der Begeisterung für die Wahrheit, und es ist gewiss eben so sehr ihm, wie dem Fortschritte der Wissenschaft im Allgemeinen zu danken, dass seine Lehre immer mehr an Terrain gewann. Professor Semmelweis starb im kräftigsten Mannesalter, er hatte das 50. Jahr noch nicht erreicht, und hinterlässt drei unmündige Kinder." Cf. *Pester Lloyd*, Aug. 15th, 1865. No. 187.

37. Semmelweis halála (The Death of Semmelweis). *Gyógyászat* (1865) p. 590.
38. "*Professor Semmelweis ist gestern seinem Leiden erlegen. Wir melden heute nur mit wenigen Worten diese betrübende Nachricht. Wenn wir auch die Art und Weise, wie der Verstorbene in den letzten Jahren seinen Fachkollegen gegenüber aufgetreten ist, nicht gutheissen konnten, so haben wir doch seinem Streben und seinen Leistungen Gerechtigkeit widerfahren lassen.*"
39. *OH* (1865) pp. 551–552.
40. Nat. Arch., 66 235/1865.
41. A lelépő ngys. Kormánynok dr. Schopper György hittanár úrnak beszéde a kir. magyar tudományos egyetemen az 1864/65. tanévi állapotokról (The retiring Rector, Dr. György Schopper, Professor of Theology, making his final address at the Royal Hungarian University of Sciences about the academic year 1864–65). *Gyógyászat* (1865) pp. 824–837. For full text of the address, cf. *International Semmelweis Memorial Volume*. pp. 66–67.
42. *Yearbook of the Medical Society of Pest–Buda, 1865.*
43. Schürer von Waldheim believes—cf. *Aerztliche Reform Zeitung* (1907) pp. 15–16—that the autopsy on Semmelweis's body was performed by Theodor Herman Meyert (1833–1892), pathologist of the Lower-Austrian Mental Home.
44. It was customary in these days to publish the autopsy record of well-known personalities. Gyula Magyary Kossa in vol. I of his *Magyar Orvosi Emlékek* (*Hungarian Medical Records*) published the autopsy record of Ferenc Deák, and in vol. II that of László Teleki (performed by Scheuthauer, and Arányi and Flór, respectively). Victor Babes in an article entitled 'Gambetta halálának oka' (What Caused the Death of Gambetta) submitted to the public his post mortem record. Cf. *OH* (1883) pp. 36–38.
45. "Hyperaemia of meninges, cerebral hyperaemia and atrophy and chronic hydrocephalus. Grey degeneration of spinal marrow. Necrosis on middle finger of right hand, perforating the last interphalangeal joint. Metastases in the subcutaneous connective tissues of limbs, metastatic abscess between left major and minor pectoral muscles, perforating chest and causing left-sided pyopneumothorax."
46. Semmelweis Ignác tanár holt testének vizsgálata (Examination of the Dead Body of Semmelweis). *OH* (1865) pp. 763–768.
47. *Gynaecologia* supplement of *OH* (1902) pp. 2–3.
48. *OH* (1906) p. 1.
49. *Ungarische Medizinische Erinnerungen.* (Budapest, 1935) p. 294.
50. "*Ebensowenig können wir heute zugeben, dass Verdruss, Verkennung, Zurücksetzung, Verfolgung durch Unverständige, Übelwollende, Neidische eine organische Gehirn- und Rückenmarkkrankheit zu bewirken und ins Irrenhaus und ins Grab zu führen imstande sein. Aus einem anregenden Gespräch mit Herrn Kollegen Konrad Rieger ging hervor, dass es nicht überflüssig sei die Fragen was hat auf Semmelweis lebensverbitternd gewirkt, was hat sein Leben verkürzt, wie und woran ist er gestorben, aufs neue aufzunehmen. Bei einem Aufenthalte in Wien hoffte ich genauere Aufschlüsse zur Beantwortung zu gewinnen, insbesondere Einzelheiten zur Krankengeschichte und das ausführliche Sectionprotokoll. Eine Abschrift des letzteren ist mir durch Herrn Kollegen Isidor Fischer aus dem Institut für die pathologische Anatomie besorgt worden; es stimmt mit dem im Orvosi Hetilap veröffentlichten Protokoll über den Leichenbefund überein. Die Biographien von Jakob Bruck (1887) und von Schürer von Waldheim (1905) geben zur Krankengeschichte wenige, aber wichtige, bisher übersehene*

Züge. Die Zeichen einer fortschreitenden Gehirnstörung, die Unsicherheit des Gangens im letzten Jahre, die engen Pupillen an der Leiche, der Befund einer degeneratio grisea medullae spinalis von dem Psychiater-Anatomen Meynert festgestellt, genügen zur Diagnose." Cf. Georg Sticker, Semmelweis. *Zeitschrift für Geburtshilfe und Gynäkologie* (*Stuttgart*) (1924) pp. 314–334.

51. F. Bruck, Semmelweis, nicht Lister. *Janus* (*Amsterdam*). (1929) pp. 301–309.
52. P. Diepgen, *Geschichte der Medizin. Mit einem Rück- und Ausblick auf die Entwickelung der Heilkunde in den letzten 50 Jahren* (Berlin, 1962) vol. II, p. 197.
53. M. Dawson, Semmelweis. An Interpretation. *Annals of Medical History* (1924) pp. 258–271.
54. G. A. Wagner, I. Ph. Semmelweis und die Verhütung der pyogenen Infektion. *Der Chirurg* (1934) pp. 276–283.
55. "*Unglücklicherweise erkrankte er an einer Paralyse, bevor er für seine Lehre die allgemeine Anerkennung erreicht hätte. Die letzten Teile seines Hauptwerkes und die Offenen Briefe dürften mit ihren sich im Kreise drehenden Ausführungen und stereotypen Wiederholungen, mit den skurillen Angaben der Sterblichkeit schon unter dem Einfluss der Erkrankung entstanden sein. Auch Form und Heftigkeit der Angriffe, die Semmelweis darin gegen die Medizin seiner Zeit richtet, verraten die verhängnissvolle Entwicklung. Im Sommer 1865 befand er sich bereits in einem so desoluten Zustand, dass man entschloss, ihn in eine Wiener Irrenanstalt zu bringen.*" Cf. Creutz and Streudel, op. cit.
56. István Benedek, *Semmelweis és kora* (*Semmelweis and His Age*). (Budapest, 1967) p. 415.
57. Paralysis, cerebral atrophy and chronic hydrocephalus.
58. R. Temesváry, Semmelweisről — egy híres kortársa (About Semmelweis — A Famous Contemporary). *Pesti Napló* (*Diary of Pest*), February 6th, 1927.
59. Schaffer, Károly: Semmelweis lelki világáról (Semmelweis's Mentality). *A Magyar Tudományos Akadémia Matematikai és Természettudományi Értesítője* (*Mathematical and Natural Historical Publications of the Hungarian Academy of Sciences*), vol. 59 (1939) pp. 802–810.
60. Gy. Regöly-Mérei, Semmelweis Ignác betegsége orvostörténelmi megvilágitásban (The Illness of Ignác Semmelweis in the Light of Medical History). *Orsz. Orvostört. könyvtár közl.* (*Publ. of the Hungarian Med. Hist. Library*). (1960) pp. 13–28.
61. L. Haranghy, Semmelweis Ignác betegsége kórbonctani szempontból (The Illness of Ignác Semmelweis from a Pathological Anatomical Viewpoint). Ibid. (1960) pp. 29–36.
62. Gy. Nyírő, Die Krankheit von Ignaz Semmelweis im Spiegel der Psychiatrie. *Das Deutsche Gesundheitswesen* (1960) pp. 156–158; L. Haranghy, Gy. Nyírő, Gy. Regöly-Mérei and T. Hüttl, *Semmelweis betegsége* (Semmelweis's Illness). (Budapest, 1965). The book summarizes the views of these authors submitted in previous publications.

Chapter Eight

Priority Claims to the Semmelweis Doctrine

Distortion of the doctrine — Disputes concerning the priority of Holmes — The precursors of Semmelweis — Semmelweis alone discovered the real cause of puerperal fever and the measures to defeat it

Distortion of the Doctrine

From the foregoing it should be obvious that the essence, truth and aetiological application of the Semmelweis doctrine has been unequivocally established.

The fact that priority claims should have existed at all are due to the distortion and superficial study of the doctrine itself. There were some who would have liked to restrict Semmelweis's theory to cadaveric infection only, others again identified it with old-fashioned contagionist views. Even in our own days numerous publications on Semmelweis contain the same errors, clearly proving that the misrepresentation of his teachings is still possible, although Semmelweis himself had refuted both views in his writings.

In his Open Letter addressed to Siebold, Semmelweis explicitly said: "If you, Herr Hofrath, in spite of everything, thrust on me a doctrine maintaining that all cases of puerperal fever are produced by cadaveric infection, that amounts to wilful misrepresentation of my teaching, or lack of the ability to understand it" . . "Herr Hofrath, you seem to agree with me when stating that cadaveric infection cannot be the only reason causing a puerperal epidemic. I fully endorse your opinion that puerperal fever is not always caused by cadaveric infection. You, Herr Hofrath, are conjecturing rightly when declaring the cadaveric infection theory too exclusive and exaggerated."

Semmelweis explained clearly the difference between his own and the contagion theory in his article: "Where I Disagree with the English Physicians in the Question of Puerperal Fever."

At the 8th Conference of German Gynaecologists, Zweifel, on the fiftieth anniversary of Semmelweis's discovery, expressed the view that those who assert priority claims over Semmelweis will not succeed, nor will it be to the credit of those who support them [1].

We do not want to dispute the place of those who, led by humane feeling and enthusiasm, have rendered service to mankind by recognizing even partial truths and contributed to diverting the menace of puerperal fever. The fact that Semmelweis's discovery was original and that priority must necessarily go to him in the solution of the problem, does not diminish the services of White, Denman, Gordon, Cederschiöld, Kneeland, Trusseau, Eisenmann and Holmes.

James Young Simpson, in his reply to Arneth, stated soon after the discovery that there was nothing new in it, since nobody in England had denied that puerperal fever was a contagious disease. He thus identified Semmelweis's teaching with the contagionist theory. We can find the same mistake in various writings which do not recognize the originality of the Semmelweis doctrine, even though Simpson himself later gave up the view that puerperal fever was a specifically contagious disease.

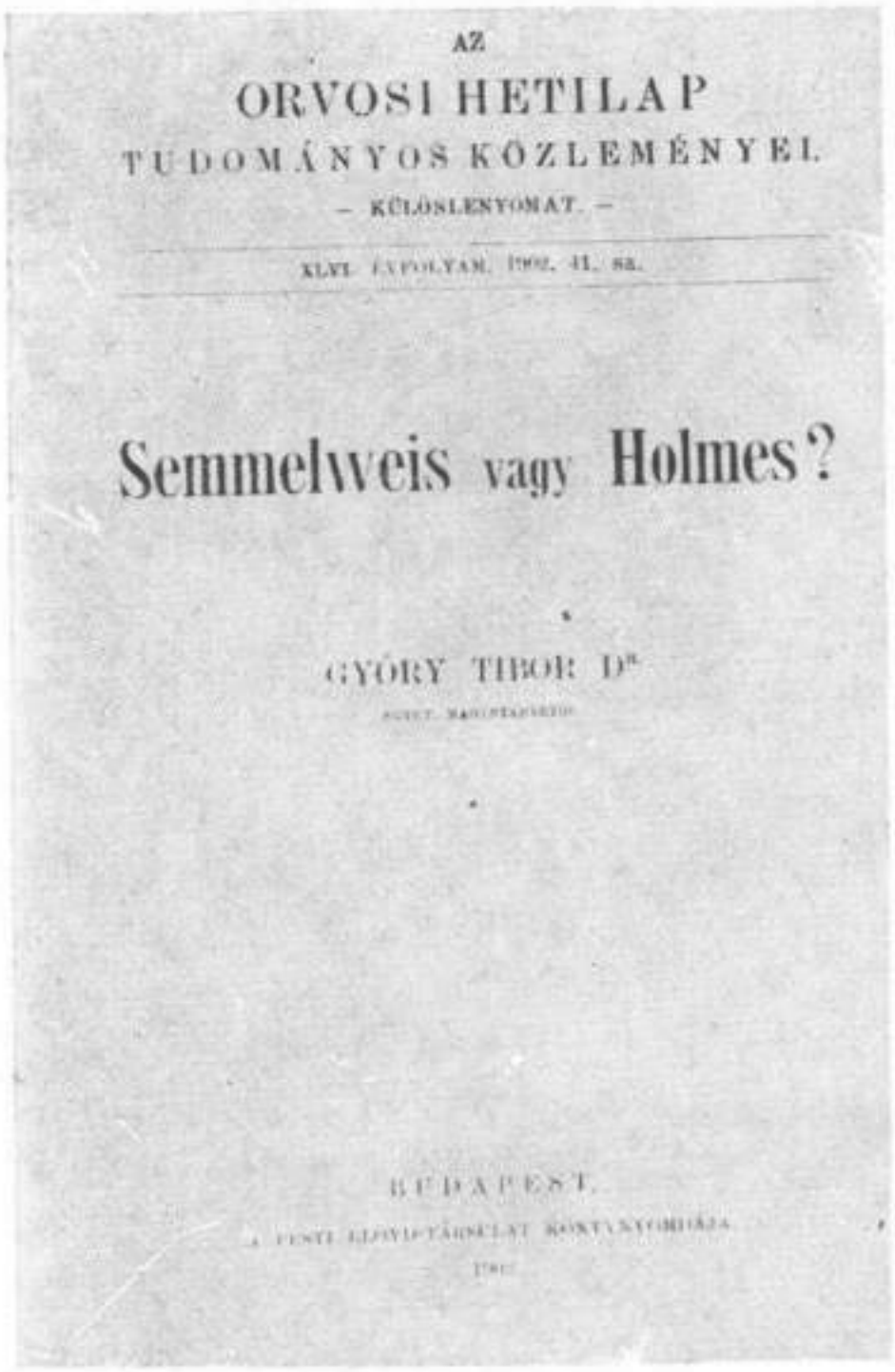
Disputes Concerning the Priority of Holmes

The longest and most bitter dispute raged in connection with the priority of Holmes.

An American physician, Simon Baruch raised the question of priority between Holmes and Semmelweis at a committee meeting of medical historians during the 74th Karlsbad Conference of German Physicians and Natural Scientists on September 22nd, 1902. "The privilege of convincing the medical world about the effectiveness of prophylactic measures to prevent the spread of that dreadful disease has been attributed to the unhappy Semmelweis. It is far from me to deprive him of his laurels as he had had a wonderful chance to try out the methods of prevention in a great lying-in hospital and to work out the modern asepsis of midwifery. When Semmelweis explained his theory, he met with violent opposition from the side of Kiwisch, Scanzoni, Karl Braun and other excellent men, which had exasperated him to the extent that he actually became insane. The most critical historian who is in search of justice should hesitate before tearing off a single leaf from the wreath of a man who sacrificed himself for his ideas. Nevertheless the critical historian cannot be reluctant to insist on the just priority of an American physician who expressed the same thought five years before Semmelweis. Dr. Oliver Wendell Holmes, Professor of Anatomy and Physiology in Harvard University, lectured on puerperal fever in the Boston Society for Medical Improvement and at the request of the Society published the text of his lecture in the *New England Quarterly Journal of Medicine and Surgery* (April 1843) under the title "The Contagiousness of Puerperal Fever", insisting that puerperal infection was due to cadaverous poison" [2].

Baruch compares Holmes's points with Semmelweis's preventive measures and says that they are identical in value. He admits that Semmelweis had made the use of the nailbrush compulsory; in this point, and only here, is his priority recognized. According to Baruch, in 1855 Holmes quoting the Paris lecture of Arneth also mentioned Semmelweis's suggestions concerning the chlorine handwash and the use of the nailbrush, insisting that the latter had considered cadaveric poison the cause of puerperal fever [3].

We have discussed Holmes's contribution above, and have quoted also the preventive measures suggested by him. There was nothing new in his views even in 1843: he simply professed the old beliefs of the English contagionist school.


AZ

ORVOSI HETILAP

TUDOMÁNYOS KÖZLEMÉNYEI.

– KÜLÖNLENYOMAT. –

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Semmelweis vagy Holmes?

GYÖRY TIBOR Dr.

BUDAPEST.

Reprint from the *Medical Weekly*. "Semmelweis or Holmes" by T. Győry

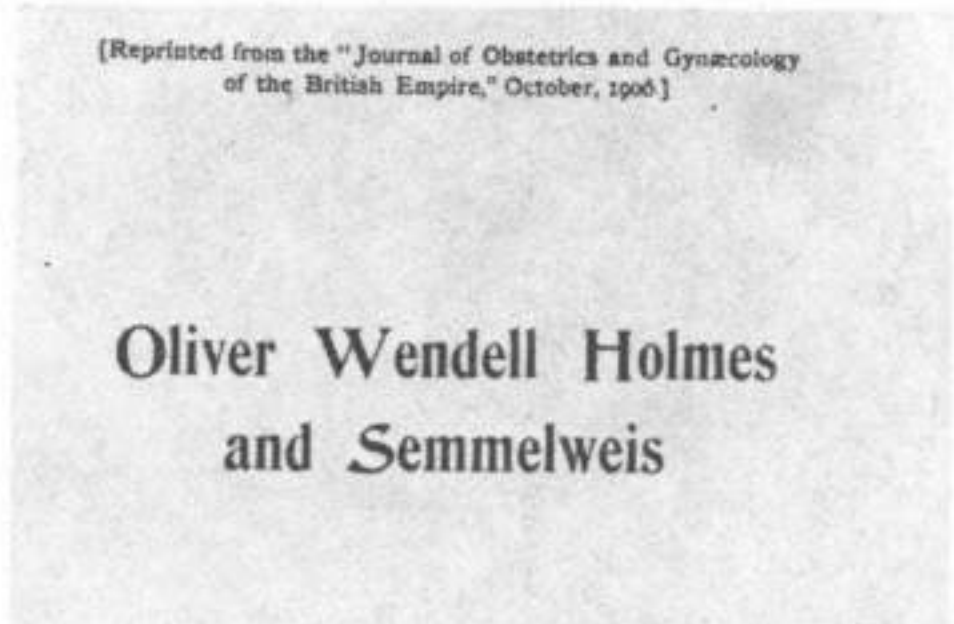
Holmes also regarded puerperal fever as a specific disease which can be conveyed from one puerperal patient to another through the medium of the air.

It was T. Győry who undertook the task of proving that Holmes had not come to the same conclusions as Semmelweis a few years earlier than the latter [4]. He proved that, although Holmes had in fact discovered that a relationship existed between dissection and puerperal fever (perceiving that the disease is contagious in the sense of being conveyable from one patient to another through the medium of a doctor or a nurse), nevertheless he failed to see its identity with pyaemia, which is really the salient point of Semmelweis's discovery. Holmes had not discovered the mechanism of infection and had left the question entirely open as to whether conveyance happened through the air or by direct means. From his prophylactic rules it seems to be obvious that he had believed that the infection was conveyed through the air. According to his points 1–3, the obstetrician should refrain only from the dissection of patients who died of puerperal fever or erysipelas. The requirement of point 4 demanding the physician to refrain for some weeks from lying-in practice seems to be quite superfluous. The same point making it the physician's duty to protect his patient from catching the disease and to minimize lethal cases seems to be too vague in want of information as to how to achieve this. Another striking difference in the attitude of Holmes and Semmelweis is that, whereas Holmes requires the physician to bathe and wash his hands after a post mortem examination, Semmelweis insists that he should apply the chlorine handwash before touching the lying-in patient. Therefore, states Győry, although the preventive rules of Holmes are of considerable importance, they differ basically from Semmelweis's and clearly show that they are not based on any recognized certainty.

As far as the question of the chlorine disinfectant is concerned, it must be admitted that it was not Semmelweis who introduced it into obstetric practice, nor was it Holmes either, but Gottfried Eisenmann, in 1835, to prevent the "putrescence of the uterus". Győry summarized the debate in No. 15 of *Janus*,

1903, by stating that the teaching of Holmes and Semmelweis being basically different it is not possible "to raise the question of priority between them" [5].

The English medical journal *Lancet* also contributed an article to the debate in 1902 under the title "The Discoverer of the Aetiology of Puerperal Fever". It contends that "there can be no real question of priority. Holmes did good service to obstetrics and consequently to humanity, but he discovered nothing; he added nothing to the sum of the scientific knowledge of obstetrics by his essay on 'The Contagiousness of Puerperal Fever'. Semmelweis, on the other hand, discovered the lone cause of puerperal fever, he laid the scientific basis of our prophylaxis, and so rendered a service to humanity comparable only with that of Jenner" [6].


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Oliver Wendell Holmes and Semmelweis

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Győry's paper in an English periodical

Lancet taking up the question again in 1909 repeatedly stated that the Holmes theory was not identical with the Semmelweis doctrine. No one can deny the services of Holmes but it does not take away a jot from Semmelweis's merits, nor from his priority [7].

Baruch disregarded Győry's unambiguous statement concerning the difference between Semmelweis's teaching and the contagionist theory, nor did he take any notice of the opinions of the *Lancet*, and notwithstanding unfavourable reactions, repeatedly re-issued his priority claim for Holmes in 1905, 1911 and 1914. In 1911 among other things he said: "The published data establish the priority of Holmes (by five years) in the theory of transmissibility of puerperal fever and its prevention by disinfection. For Semmelweis may be claiming priority in the use of the nailbrush, which now plays so important a role in asepsis. *Fiat justitia, ruat coelum!*" [8].

Baruch stuck to his error and was not willing to recognize the priority of Semmelweis except in the use of the nailbrush. Paul Richter may be right in his conviction that Baruch had never read the *Aetiology* [9].

Unfortunately Baruch was not the only one to identify the contagionist views with those of Semmelweis, nor was he alone in his attempt to claim priority for Holmes. It is most surprising that from among those who maintained contagionist views, Holmes should have made the greatest impression on the historians. This

accounts for the fact that so many raised their voices in favour of his priority in the literature. The view even cropped up in the last decades, although the English contagionists had preceded Holmes by a long period of time.

In his *History of Obstetrics* (1904) Dohrn, Professor of Obstetrics in Königsberg, expressed the same attitude: " . . . correct views existed in America on puerperal fever several years before Semmelweis's book and letters had appeared" [10].

James Cullingworth, English obstetrician, must have also been impressed by the literary activity of Holmes because he, too, spoke up in favour of his priority in 1905. T. Győry had to come forward once again in defence of the truth. Again he had to stress that not minor but basic differences existed between Holmes and Semmelweis. Semmelweis's priority did not in the slightest interfere with the merits of Holmes, which had been duly recognized by Cullingworth [11].

The *Journal of the American Medical Association*, in its December 8th, 1906 number, on the occasion of the unveiling of the Semmelweis monument in Budapest, again raised the question of Holmes's priority, in an article entitled "Puerperal Fever and a Monument to Semmelweis". It also published another paper entitled "Holmes and not Semmelweis" on April 14th, 1914. Referring to the Semmelweis memorial speech made by Gyula Dollinger in 1914, the writer accuses the Hungarians of being badly informed as regards world literature (!) when depriving Holmes of the laurel, who, 4 years before Semmelweis, in 1843 had discovered and described puerperal fever as a contagious disease. With a complete disregard of the whole debate, the well-known American medical periodical designated Holmes as the real discoverer of the aetiology of puerperal fever.

Otto Herff, Professor of Obstetrics in Basel, also claimed priority for Holmes in a chapter contributed to Winckel's handbook of obstetrics, saying: "Beside Ignác Semmelweis, another physician should also be named who, much before him, had discovered that puerperal fever was conveyable through infection, and who had endeavoured to devise rules to prevent it. That man was Oliver Wendell Holmes, who lived in North America. In 1843 he professed that puerperal fever was a contagious disease, often conveyed by physicians and nurses from one patient to another" [12].

It is evident that another American obstetrician, L. E. Neale of Baltimore, was not well acquainted with Semmelweis's discovery when in 1907 he commented thus: " . . . O. W. Holmes should be given the well-deserved credit and honor both for priority over Semmelweis in point of publication of the essential truths concerning the contagiousness of puerperal fever, as well as for the most positive and explicit rules and direction to be observed for its prevention" [13].

Beside Győry, other researchers also tried to prove that truth was on the side of Semmelweis. Heinrich Fassbender in his history of midwifery, corrected the error made by Dohrn and recognized the full truth of Semmelweis's teaching [14]. We have mentioned above the two articles in *Lancet* which were on Semmelweis's side. In the same paper, Clifford Thomas Allbut (1836–1925), English medical historian, professor in the University of Oxford, also recognized the

priority of Semmelweis in 1907. It was at the same time when, on the occasion of the unveiling of the Semmelweis memorial, Cullingworth again raised his voice in favour of Holmes [15].

In 1912 H. E. MacDermott, by comparing the activities of the two men, had come to the conclusion that Holmes was more a theoretician and a writer who could have had no direct experience with puerperal fever and must have borrowed his ideas from others. The thoughts of Semmelweis, on the other hand, are just as true today [16].

Zweifel also came forward arguing with Herff and stating that the latter had put old arguments in a new garb in favour of Holmes's priority. Yet he only succeeded in proving that Holmes had discovered the contagious nature of puerperal fever before Semmelweis. One of the preventive measures suggested by Holmes tells the physician and nurse who had dealings with puerperal patients (not only the midwives who may have performed internal examinations) to shut themselves up for a month before visiting another childbed patient. He probably assumed that the contagion which was transmitted through the air could also spread by contact with clothes. The gist and *conditio sine qua non* of Semmelweis's teaching, says Zweifel, is *exploratio obstetricia interna* with a contaminated hand. Holmes made no reference to this; consequently it is futile and superfluous to tear the laurels from Semmelweis's brow to give them to Holmes who, though full of good intentions, had suggested useless measures. These clearly indicate that the English and American contagionists, with Holmes at their head, had only discovered half of the truth; whereas Semmelweis had revealed the full truth concerning the aetiology of puerperal fever [17].

As the years passed, medicine began to accept a more uniform view in the question of Semmelweis's priority.

Alexandre Couvelaire believed that Holmes had only made a few timid steps towards antisepsis, whereas Semmelweis had proved in practice that puerperal fever was the result of a septic infection [18].

Daily contended that Holmes had escaped his critics, but Semmelweis "was fortunately not a writer but a fanatic obstetrician" [19]. In 1943, hundred years after the publication of Holmes's essay in 1843, Watson re-examined the question of Holmes's priority and came to the conclusion that the latter could not have had any practical experience with regard to puerperal fever. On the other hand, the contagiousness of the disease had been discovered before him by White in 1773 and by Gordon in 1796 [20].

In 1950 the *Virginia Medical Monthly* also re-examined the Semmelweis–Holmes controversy, and came to the conclusion that the latter not being an obstetrician could have had no practical experience with puerperal fever. His paper had no practical followers, best proved by the fact that obstetric prophylaxis was not introduced in Boston before 1883 [21].

One by one, Diepgen, Fischer, Hueppe, Schauta, Richter, Daily and many others refused to give serious consideration to the question of Holmes's priority. This concensus of opinion is by no means upset by a few controversial views.

Sigerist in 1933 cannot be regarded objective any more when he insisted that the American Holmes had discovered the contagiousness of puerperal fever and that Semmelweis had come to the same result four years later [22].

The Precursors of Semmelweis

The recognition of the originality of Semmelweis does not prevent us in any way from acknowledging the services of Holmes, which nevertheless immediately call to mind those of his precursors, the English contagionists. Győry did not consider the contagionists the forerunners of Semmelweis since they had not discovered the essential features of puerperal fever nor its real nature.

As far as the aetiology of the disease is concerned, they were obviously in the wrong but they did discover certain partial truths about it, and achieved certain results in their prophylaxis—as we have repeatedly insisted in connection with Gordon, White, Cederschiöld and others. We are certain that they deserve more credit for their work than has so far been given to them and they can well be called the direct precursors of Semmelweis.

No doubt their services are equal to those of Holmes, but the fact that they had reached their conclusions much earlier should give them more credit. This naturally does not imply that their theory was right or that, because of their prophylactic measures, priority should be given to any of them.

In an article on puerperal fever (1875) the English J. Robert Lee emphasized the merits of Gordon against the "German" Semmelweis [23]. From clinical observations, Gordon had proved before Semmelweis that puerperal fever was a secondary infection. At the same time Lee quotes another observation by Gordon according to which the cause of the disease was a specific contagion. Gordon, on the other hand, in his above-quoted treatise openly confessed: ". . . with respect to the physical qualities of the infection, I have not been able to make any discovery".

Recently J. A. Porter, discussing the work of Gordon, insists on a proper evaluation of his merits [24]. Poynter regards Gordon as the direct forerunner of Semmelweis [25].

J. G. Adami, Professor of Obstetrics in Liverpool, in a lecture held in 1921 under the title: "The Manchester School: Charles White of Manchester and the Arrest of Puerperal Fever" maintained that White had actually done the work which Semmelweis discovered later [26].

Arthur Henry Burgess (b. 1874), former Professor of Surgery in Manchester University, in a Hunter lecture in 1941 attributed the glory of the pioneer to Charles White. He insisted that Semmelweis had re-discovered 75 years later what had been discovered by Charles White before him. The only thing, said Burgess, not seen by White was that the examining fingers of the medical student contaminated by cadaverous particles can also transmit the infection. The merit of Semmelweis was simply to conquer puerperal fever, "but the glory of the pioneer must be awarded to Charles White" [27].

White's brave stand to produce absolute cleanliness in the lying-in ward in 1773 should be praised as staunch pioneer work, but the reasoning of Burgess cannot claim serious consideration.

G. W. Kaan, contrary to the above views, believes that Sir Thomas Watson should be considered as the true discoverer of the real cause of puerperal fever [28].

Semmelweis Alone Discovered the Real Cause of Puerperal Fever and the Measures to Defeat It

Sound authorities in obstetrics and medical history do not hesitate in acknowledging that it was Semmelweis alone who had thrown light on the essential features of puerperal fever. Friedrich Schauta, Karl Braun's immediate successor in the 1st Obstetric Clinic of Vienna, in his excellent textbook comments as follows: "The merit undoubtedly goes to Semmelweis for being the first to discover the now well-known and recognized aetiology of puerperal fever and of wound-infection in general" [29].

W. J. Sinclair in his often-quoted book does not agree with those who wish to dispute Semmelweis's claim to priority, which alone is due to that great benefactor of mankind. He insists that even those who only read parts of Semmelweis's book cannot fail to see that neither Gordon nor Holmes can be mentioned with him in the same breath unless to prove that they were wrong in their opinions: "An effort has been made in the long chapter on 'Some Forerunners and Contemporaries' to settle the question of priority in certain respects, especially regarding the mistaken and altogether groundless claims put forward in recent years for O. W. Holmes. Only misapprehension of the scientific points at issue, in the absence of patient study of the history of midwifery, could have made such pretensions possible" [30].

In Döderlein's great handbook of midwifery, Zweifel contributing to vol. III criticized the unfounded priority claims in favour of the English and American contagionist school [31]. He confirmed that the contagionists were fundamentally believers in the miasma myth, whereas Semmelweis advanced a new theory with the discovery of contact infection. Zweifel branded as entirely irresponsible the attempt to tear the laurels from the brow of Semmelweis and hand them over either to Holmes, who filled with the best of intentions insisted on futile measures, or to any other contagionist.

Prof. Schönbauer, medical historian of Vienna, expressed the view that the services of Semmelweis cannot be minimized because Denman, White, Gordon Kirkland, Eisenmann, Holmes and Watson had discovered parts of the truth [32]. Stöckel shares the opinion that Denman, White, Gordon and mainly Holmes had got close to the truth, but even Holmes had not understood the mechanism of the conveyance of the infection. The cause and prevention of puerperal fever were left to Semmelweis to discover [33].

Time has passed over those who, not being able to question the doctrine itself, began to raise doubts as to its originality. Zweifel's prophecy uttered 70 years ago has come true. The priority claims did not serve the glory of those in whose favour they were raised nor did they benefit those who raised them. Obstetrics and medical history today both recognize the priority of the Semmelweis doctrine. This can best be characterized by the words of Schürer von Waldheim: "There is only one discoverer of the rational theory concerning the cause of puerperal fever, and there was nobody but Semmelweis who would have grasped the essence of that disease with the same clarity and perspicacity" [34].

Notes

1. Die 50-jährige Gedenkfeier der Semmelweisschen Entdeckung. Eröffnungsrede von Paul Zweifel gewidmet dem Andenken von Semmelweis. *Verhandlungen der Deutschen Gesellschaft für Gynäkologie*. Siebente Versammlung, abgehalten zu Leipzig am 9. bis 11. Juni, Leipzig, 1897.
2. Cf. *New England Quarterly Journal of Medicine and Surgery* (1842–43) p. 503. The quarterly medical journal of Boston had a small circulation and one year after the publication of Holmes's article ceased to exist. Baruch comments that the contribution was practically unknown until 1855 when it was published again with amendments. The quotation given in the text is a translation from the German version of the paper, as a copy of the original was not available to us.
3. The new title of Holmes's re-published paper was *Puerperal Fever as a Private Pestilence*. (Boston, 1855). Holmes supplemented it with an appealing introduction for "the medical doctors and students of Harvard University", and with a few case histories: "Additional References and Cases". He also published a reply to two American professors who had criticized his original lecture. Cf. H. L. Hodge, *On the Non-contagiousness of Puerperal Fever*. (Philadelphia, 1852); C. D. Meigs, *Childbed Fever; Obstetrics, the Science and Art*. (Philadelphia, 1854). Both authors criticize the statements and suggestions of Holmes. In 1852 Hodge said that he was more willing to attribute puerperal fever to accident or fate than to a contagion which he could not account for in connection with this disease.
4. T. Győry, Semmelweis vagy Holmes? (Semmelweis or Holmes?). *OH* (1902) p. 46. Cf. Bemerkungen für Prioritätsfrage Holmes—Semmelweis. *Janus* (*Amsterdam*) (1903) p. 46.
5. "*. . . dass es sich zwischen Semmelweis und Holmes um keine Prioritätsfrage handeln kann.*"
6. The Discoverer of the Etiology of Puerperal Fever. *Lancet* (1902) pp. 324–325.
7. *Lancet* (1909) p. 882.
8. *The Medical Record* (*New York*) (1911) pp. 211–215.
9. P. Richter, Holmes und Semmelweis. *Berliner Klin. Wschr.* (1913) pp. 1821–1822.
10. "*. . . so dass die richtigen Ansichten über die Veranlassung der Krankheit Kindbettfieber in Amerika schon einige Jahre allgemein geläufig waren, vor dem Erscheinen der Monographie und der Briefe von Semmelweis.*" Cf. R. Dohrn, *Geschichte der Geburtshilfe*. (Tübingen, 1904). Part I, p. 226.
11. Charles J. Cullingworth and T. Győry, Semmelweis és Holmes. Két közlemény (Semmelweis and Holmes. Two contributions). Introduction by G. Dirner. *Budapesti Orvosi Újság, Szülészet és Nőgyógyászat* (*Budapest Medical News, Obstetrics and Gynaecology*) (1906) p. 38.
12. "*Daher muss neben Ignaz Semmelweis ein anderer Arzt genannt werden, der von Ihm aller Schärfe das Kindbettfieber als nur durch Ansteckung übertragbar erkannt hat, und der sich nachdrücklichst bemüht hat, entsprechende Vorbeugungmassregeln durchzuführen:*

Oliver Wendell Holmes, der in Nord-Amerika lebte. Dieser Arzt hat in 1843 klar dargelegt, dass jene Krankheit, die als Kindbettfieber bekannt sei, ansteckend sei und dass Kindbettfieber häufig durch Aerzte und Pflegerinnen von einer Wöchnerin zur anderen verschleppt werde." Cf. O. Herff, in Wickel, *Handbuch der Geburtshilfe*. (Wiesbaden, 1906) vol. III, Part 3, p. 333.

13. L. E. Neale, Concerning the Early History of Puerperal Fever. *The Hospital Bulletin, Maryland* (1907) pp. 5–8.
14. H. Fassbender, *Geschichte der Geburtshilfe*. (Jena, 1906) p. 1028.
15. The Respective Merits of Semmelweis and Oliver Wendell Holmes in the Treatment of Childbed Fever. *Lancet*, January 19 (1907).
16. H. E. MacDermott, Semmelweis and Holmes. *Journal of the Canadian Med. Assoc.* (1912) pp. 24–32.
17. P. Zweifel, *Arch. f. Geschichte der Medizin* (1920) pp. 181–190.
18. A. Couvelaire (1873–1948), Professor of Obstetrics in Paris from 1914, Esquisse de l'histoire de la fièvre puerpérale. *Gynécologie et d'Obstétrique* (1928) pp. 1–10.
19. J. A. Daily, Semmelweis: Discoverer of the Cause of Puerperal Fever. *Atlantic Medical Journal* (1926) pp. 417–421.
20. Watson, Oliver Wendell Holmes. A Century's Vindication of his Work on Puerperal Fever. *Bulletin of the New York Academy of Medicine* (1943) pp. 527–539.
21. Editorial, Ignaz Philip Semmelweis (1818–1865). *Virginia Medical Monthly* (1950) pp. 258–259. I. Ph. Semmelweis Issue.
22. Henri Sigerist (1891–1957), Swiss medical historian, Professor in Leipzig, later in Johns Hopkins University, Baltimore, *Amerika und die Medizin*. (Leipzig, 1933) p. 352.
23. J. R. Lee, Puerperal Fever. The Gulstonian Lectures on Puerperal Fever. *Brit. Med. J.* (1875) pp. 267–270, 303–306, 337–339, 371–372, 408–409, 440–442.
24. A. J. Porter, *Alexander Gordon, M. B. (1752–1799)*. (Edinburgh, London, 1958) p. 92.
25. F. N. Poynter, Alexander Gordon. A Scottish Forerunner of Semmelweis. *Brit. Med. J.* (1960) p. 462.
26. John Georg Adami (1862–1926), from 1919 Professor of Obstetrics in Liverpool, *The Manchester School: Charles White of Manchester and the Arrest of Puerperal Fever being the Lloyd Roberts Lecture*. (Manchester, 1921).
27. A. H. Burgess, Development of Provincial Medical Education, Illustrated in the Life and Work of Charles White of Manchester. *Lancet* (1941) pp. 235–240.
28. G. W. Kaan, *Annals of Gynaecology and Paediatry, Philadelphia* (1908) pp. 216–219.
29. "*Semmelweis gebührt das unsterbliche Verdienst, dass er als Erster auf die heute allbekannte und allseits anerkannte Aetiologie des Puerperalfiebers, sowie der Wundinfectionskrankheiten hingewiesen hat.*" F. Schauta, *Lehrbuch der gesammten Gynäkologie* (Leipzig–Wien, 1896) p. 1909.
30. Sinclair, op. cit. p. 367.
31. *Handbuch der Geburtshilfe*. (München, 1924–1925) vol. III, p. 390.
32. L. Schönbauer: Die Vorläufer des Ignaz Ph. Semmelweis. *Wiener Klin. Wschr.* (1947) pp. 369–372.
33. W. Stöckel, *Lehrbuch der Geburtshilfe* (Jena, 1956) p. 1032.
34. "*Es gibt nur einen Begründer der rationellen Lehre von der Entstehung des Puerperalfiebers, und neben Semmelweis war niemand, der das Wesen dieser Krankheit mit gleicher Klarheit und Schärfe erfasst hätte.*" Cf. Schürer von Waldheim, op. cit. p. 241.

Chapter Nine

Semmelweis and Lister

Semmelweis and Lister, two different careers — A spurious and a real statement made by Lister on Semmelweis — Indirect contact between Semmelweis and Lister — Surgery and the Semmelweis discovery — The Semmelweis tradition in Hungarian surgery — Semmelweis or Lister? — Semmelweis and Lister

Semmelweis and Lister, Two Different Careers

In his address at the international celebrations held on the hundred years' anniversary of Lister's birth in 1927, Max Gruber, the president of the Bavarian Academy of Sciences, referred to Semmelweis and Lister, as two great medical discoverers whose contributions were equally important in defeating the century-old menace of wound-infection [1].

The conditions under which Semmelweis and Lister worked were quite different, nor did they arrive at their results in the same way. Semmelweis discovered the cause of puerperal infection without knowing anything about bacteriology, simply by empirical means, based on his pathological experiences and on the enormous statistical data at his disposal. By his prophylactic measures he actually introduced the simple technique of asepsis. Although he conducted experiments on animals to see if the putrid animal material introduced into their genitals would produce in them changes similar to puerperal fever, and he achieved some results, their significance was not considerable from the theoretical point of view and of little importance compared with his practical results.

Lister, on the other hand, lived on the threshold of the bacteriological age and began his studies in antiseptic surgery after the publication of Pasteur's epoch-making discoveries in fermentation. Thus he was enabled to base his method on experimental results.

For centuries it had been conjectured in medical science that some sort of connection must exist between fermentation and infection. In 1857 Pasteur had explicitly stated that no fermentation could arise without the presence of a microorganism which enters a liquid solution from without, from the air or dust, causing effervescence. With this, in fact, the principle of the microbiological origin of infection has been introduced.

Pasteur's studies on the biochemistry of fermentation (1857–1863) had proved that the process depended on the presence in the air of certain living organisms. They were nevertheless received with violent opposition because it was believed that his theory meant a return to natural philosophy [2]. The significance of

his discovery was first observed by Joseph Lister, surgeon in the Royal Infirmary of Glasgow [3]. In a lecture held in Edinburgh in 1869, the latter called the fermentation theory the north star safely guiding our ships, without which it was very unlikely that they would ever reach their destination.

In 1867 Lister published in *Lancet* his two momentous publications concerning the antiseptic treatment of wounds entitled: "On a New Method of Treating Compound Fractures, Abscesses, with Observations on the Conditions of Suppurations" and "On the Antisepsis Principle in the Practice of Surgery". In 1870, in the columns of the same journal he gave an account of the results of his new method, under the title: "On the Effects of the Antiseptic System of Treatment upon the Salubrity of a Surgical Hospital" [4].



Joseph Lister

Lister, the son of a big empire, received honours in his lifetime that Semmelweis never enjoyed. Nevertheless, Lister's career was not smooth either and he met with many setbacks and disappointments like any other new prophet. Simpson attacked Lister in 1867 in exactly the same way as he had Semmelweis in 1850; but also the chairman of the British Royal Society for Surgery, James Paget, was just as much opposed to "the surgery of the carbolic acid", — as he called the Listerian doctrine [5].

Summing up his experiences in England, O. Madelung gives us an account of the cold reception the teaching of Lister received in his own country in the eighteen-seventies: "At that time it was still touch and go", writes Madelung, "that Lister would meet the same end as the Austrian (!) obstetrician, Semmelweis" [6]. He is convinced that it was not so much due to Lister that he won the day, as to Buchner and Neuber who had worked out their methods in the antiseptic treatment of wounds in Germany simultaneously with Lister [7]. J. D. Guthrie also confirms that in 1877 there was still little interest in Lister and that there was much opposition to his doctrine and method [8].

Lister's teachings were well received on the Continent, especially in Germany. Richard Volkmann, Professor of Surgery in Halle, and Johann N. Nussbaum, Professor of Surgery in Munich, had both written enthusiastic articles about the method [9]. Lister himself had made use of the results of the German experiences

when he came to the final definition of his method in the antiseptic treatment of wounds. Antiseptic science advanced steadily and its first practical application—sterilization by means of steam under high pressure—was actually due to Bergmann (1886) [10].

In Austria Dittel accepted the Listerian doctrine in 1869, but Billroth went on opposing it as long as till 1879 [11].

Tauffer does not consider it accidental that the teachings of Lister met with more understanding in Germany. In his speech delivered on the hundred years' anniversary of the birth of Semmelweis before the Medical Society of Budapest, he commented as follows: "The modern treatment of wounds was discovered by Semmelweis and made generally applicable by Lister. It was welcomed first in Germany; this was no accident, because it was here that a decade earlier the most violent disputes had been raging over the Semmelweis doctrine, as a result of which aseptic practice had been adopted by empirical means. This paved the way for general acceptance. The ground was prepared for Lister".

A Spurious and a Real Statement Made by Lister on Semmelweis

Tauffer's remark in his speech in 1918 was not the first to note the relationship between Semmelweis and Lister. In his frequently quoted Semmelweis biography Schürer von Waldheim treats the question as follows: "At the 8th International Conference for Public Health and Demography, on September 2nd, 1894, in his address to the meeting Hueppe read a so far unknown Semmelweis letter, written by him to the Academy of Pest, and wound up by quoting Lister: 'Without Semmelweis I could not have succeeded, modern surgery owes much to that great Hungarian!' " [12].

In 1905 T. Győry proudly quoted the statement attributed to Lister in the July 16th, 1905 number of the Hungarian daily paper *The News* and again in No. 42 of 1905 of *Berliner Klinische Wochenschrift*, in his review on Schürer von Waldheim's book. The *Neues Wiener Journal* of April 9th, 1907 seriously rebuked Győry for attributing the statement to Lister. The paper maintained that the Hungarians had already appropriated for themselves the German Semmelweis, and now in their chauvinistic greed wanted to tear the laurel from the brow of the great English scientist, Lister. Győry subsequently tried to make sure whether the statement attributed to Lister was actually said by him, and if not, who was responsible for the "quotation". In collaboration with Weckerling, a physician in Friedberg, they tried to throw light on the question, if necessary by appealing to Lister himself.

It turned out that Lister was indeed not responsible for the statement, not in the form it was quoted. Lister himself denied his authorship in a letter addressed to Weckerling on September 15th, 1906. The full text of the letter was quoted during the Lister celebrations on the occasion of his eightieth birthday by the *Münchener Medizinische Wochenschrift*, on April 2nd, 1907: "When in 1865 I applied the principles of antisepsis to the treatment of wounds", wrote Lister,

"the name of Semmelweis was not yet familiar to me, and I confess, I had not even heard of his work. When twenty years later I visited Budapest, I was received with the warmest welcome both by colleagues and university students, and even at that occasion the name of Semmelweis was not even mentioned, he seems to have been forgotten by his native country to the same extent as by everybody else throughout the world. It was much later that a Hungarian physician in London of the name of Dr. Duka, had called my attention to Semmelweis and his work. Although Semmelweis never influenced my own work, I think with the greatest admiration of him and his achievement and it fills me with joy that at last he is given the respect due to him" [13].

Lister proved his acknowledgement by actively partaking in the work of the Semmelweis Memorial Committee in England between 1893–1900.

Lister's above statement was quoted by Richard Goldhahn in his book which appeared in 1940 and dealt with the work of Semmelweis and Lister in their fight to defeat infections [14].

Returning to the question of the spurious Lister statement Győry said in 1927: ". . . the by now notorious statement which attributed to Lister the words 'without Semmelweis I could not have succeeded', to the best of my knowledge was not made in Hungary, I myself having read it for the first time in Schürer von Waldheim's Semmelweis monograph, which appeared in 1905. Although both myself and Dr. Wickerling of Friedberg have done our best to find out who was responsible for the 'quotation', even interrogating Lister himself, neither 1906 nor 1907 brought any results. Even today I cannot do more than quote what Dr. Weckerling wrote to me in a letter in April 1907: 'It is indeed deplorable that the liar has not been identified'" [15].

In the available literature the spurious statement can first be read in an article written by Gyula Elischer in the Hungarian daily, *Pester Lloyd*, in its September 2nd, 1894 number. Elischer wrote the following in connection with Semmelweis: "Had he considered the situation calmly, he would have himself seen that it is impossible to alter things from one day to the other. But though the sun did not reach the zenith yet, there was considerable improvement, so much so that time had ripened for the activity of Lister, who confessed: 'Without Semmelweis I could not have succeeded, modern surgery owes much to that great Hungarian'" [16].

Most probably it is from here that the statement was taken by *Wiener Klinische Wochenschrift*, which in its September 31st number already attributed it to Hueppe, who was supposed to have quoted it in 1894 when delivering his Semmelweis lecture. Schürer von Waldheim, in turn, must have taken his information from this source. In the official text of Hueppe's lecture and in three other versions of the same published elsewhere there is no trace of the said quotation. Questioned by Weckerling, Hueppe categorically denied that he had repeated these words attributed to Lister.

Lister's actual statement about Semmelweis and its publication in *Münchener Medizinische Wochenschrift* was not enough to clear up the misunderstanding,



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and the spurious statement went on living its own life, repeated in speeches, and other writings over and over again. O. Pertik in his Semmelweis memorial speech of 1911 again made the mistake of saying that "we know from Lister's own words that in 1865 he had read Semmelweis's great book which appeared in German in 1860–61" [17]. The same error crops up in the writings of István Csapody, Rezső Temesváry, József Bäcker, Emil Grosz, Gyula Magyary Kossa, and many others [18].

No doubt can remain after reading Lister's statement. He devised his theory of wound treatment independently and, until the late eighteen-eighties, had never heard of Semmelweis. It is evident that he did not intentionally disregard Semmelweis's work, or refrain from mentioning his name.

M. Wegscheider also came to the same conclusions in 1923. Nevertheless he emphasized that without Semmelweis and Pasteur, Lister could never have achieved universal recognition [19]. In 1947 Rhoda Truax in her excellent Lister biography definitely says that Lister arrived at his discovery independently from Semmelweis [20].

In the statement quoted above, Lister mentions the name of Dr. Duka, a Hungarian physician resident in London. Theodor Duka was a remarkable personality worthy of both his original and adopted country. It was not among the least of his services that he acquainted the medical world of England with the name and discovery of Semmelweis. As early as 1860 he discussed it in the columns of *Indian Lancet* [21]. In England he wrote an article in 1886 under the title "Childbed Fever; its Causes and Prevention. A Life's History", and two years later a brochure of the same title attracted great interest and drew Lister's attention to Semmelweis. It was also due to Duka's untiring efforts that physicians in England contributed a considerable sum of money towards the cost of the Semmelweis Memorial [22].

Indirect Contact between Semmelweis and Lister

All the biographers of Lister unanimously agree that he had advanced his theory independently, without knowing about Semmelweis. Nevertheless, certain hints

have cropped up in the literature concerning the possibility of an indirect contact. It is not out of place to consider their significance here.

In No. 9 of *Münchener Medizinische Wochenschrift*, 1923, a Saarbrücken physician, Fornet, drew attention to a speech on the hundredth anniversary of Pasteur's birth delivered by Victor Wallich, Professor of Obstetrics in Paris University, at the Medical Academy of Paris [23]. He insisted that, while the world remained deaf to the teachings of Semmelweis, an old obstetrician in Edinburgh, J. Y. Simpson, had adopted them, although neither he nor any of his colleagues had confessed their adherence to Semmelweis, who was a disgraced person in Vienna. Simpson had also discussed Semmelweis's discovery with his students [24] and there can be no doubt that Lister was among these.

F. J. Hergott, Henry Varnier and Adolph Pinard [25] had previously hinted that an indirect contact probably existed between Semmelweis and Lister [25].

Lister's nephew, Sir Rickmann Godlee, famous neurosurgeon and author of the best Lister biography, has rejected this idea and insists that Semmelweis's discovery was so much disregarded in Europe that, after his death, his name was not remembered by many. From this biography we see that, on his honeymoon in 1856, Lister had visited the great medical centres of Europe. He spent about a fortnight in Vienna, meeting Rokitansky on several occasions, who had visited his father in England some time before. According to the biographer Rokitansky had not mentioned the name of Semmelweis to Lister. In 1875 he is supposed to have visited various German surgeons who later became the staunchest supporters of the Listerian doctrine, such as Nussbaum (Munich), Thiersch (Leipzig), Volkmann (Halle), Esmarch (Kiel), Kőnig (Göttingen), Trendelenburg (Bonn). He is also believed to have spent three days in Vienna during his tour [26]. In the course of his journey, the biographer insists, Lister never came across the name of Semmelweis. Sir Rickmann Godlee tells us further that famous obstetricians like Thomas Keith (1827–1895), Matthews James Duncan (1826–1890) and Sir Thomas Spencer Wells (1818–1897), who had intimate ties with Lister, the question of antisepsis being of primary importance to their practice, had never told him about the Semmelweis discovery [27].

We are, on the other hand, informed by the American medical historian Victor Robinson that Simpson had been persuaded to accept the Semmelweis doctrine by M. J. Duncan who was then his assistant [28]. Robinson's statement is corroborated by a letter addressed by M. J. Duncan to Theodor Duka on November 24th, 1888: "Thanks for the little book to the glory of Semmelweis. I have leafed through it all and never doubted his great merit" [29].

Ödön Tuszkai, a gynaecologist in Budapest and later physician in the health resort of Marienbad, describes his conversation with an English friend of Semmelweis in an article entitled, "A Friend of Semmelweis: Ch. R. Routh" [30]. According to this, Routh said that he had told Lister that while Semmelweis had suffered martyrdom because of his discovery, Lister had reaped its fruit. Routh was also supposed to have said that Lister himself recognized that Semmelweis was the real discoverer [31]. There is no doubt that these conversations

took place between Lister and Routh, but certainly not before Lister himself had come to know about Semmelweis. It seems evident that neither the name nor the discovery of Semmelweis had been mentioned to him during his visit to Hungary in 1883, when he spent several weeks there, staying in Pozsony (today Bratislava), Budapest, Tátrafüred and Balatonfüred [32].

Lister's visit to Budapest is commemorated in 1883 in an article of the *Pester Medizinische-Chirurgische Presse*, under the title, "Harmless Observations Made at the Ceremonial Session in Budapest on October 16th" [33]. Reference is made to an editorial remark in the *Prager Medizinische Wochenschrift* concerning Lister's reception in Budapest: "Professor Lister spent the last week in Budapest and was given a warm welcome. It is worth recording that no account of the event even mentions the name of Semmelweis. The medical faculty of Budapest could not have found a more adequate way of celebrating Lister's visit than by paying homage to the greatest and most talented benefactor of suffering mankind! There could not have been a fitter occasion for establishing a Semmelweis foundation. What an honour it would have been to read the name of Joseph Lister at the head of the subscribers. The Hungarians evidently do not hold Semmelweis a citizen worthy to be remembered as a credit to their faculty" [34].

Surgery and the Semmelweis Discovery

The significance of Semmelweis's discovery transcends the framework of obstetrics. Haller, the director of the General Hospital in Vienna, was not the only one to declare, as he did in his report of 1847–48, that the discovery made by Semmelweis was of immense significance from the point of view of general surgery. Semmelweis had clearly stated that "puerperal fever was the same disease which surgeons and anatomists find after surgical operations". With this statement, Semmelweis himself emphasized the surgical importance of his discovery and it was not his fault that surgery did not draw the necessary conclusions.

It is generally believed that Semmelweis's theory had no immediate impact on surgery [35]. Surgeons themselves up to the present day attribute the discovery of the treatment of wound infections to Lister alone. Few of them admit that Semmelweis had discovered and unambiguously described the concept of asepsis twenty years before Lister. In an age when the existence of bacteria had not yet been discovered, he nevertheless disinfected the examining hands and operating implements. The introduction of mechanical disinfection is closely connected with Semmelweis's name.

He did not commit these rules to paper, it is true, but there are innumerable direct and indirect references to the fact that Semmelweis was the first to apply the practice of the nailbrush and to devote strict attention to fingernails.

Above we have quoted Baruch's article in connection with Holmes's priority, in which he clearly recognizes that Semmelweis was the first to introduce the use of the nailbrush. We have also referred to Holmes's treatise of 1855 where Arneth

testifies that Semmelweis was the first to do this. F. Wiegner, a Strasbourg clinical expert, mentioned in an article in 1849 that he had witnessed Semmelweis using the nailbrush before an examination [36]. Karl Braun also referred to the nailbrush in 1855 and 1857, wanting to prove in this manner the uselessness of the chlorine handwash. Semmelweis quotes Braun's remarks in the following words: ". . . at the suggestion of Semmelweis we placed the chlorine solution into an open basin, and all students present had to dip their hands into it and clean their nails afterwards . . ." [37]. Podach also emphasizes that Semmelweis had adopted not only chemical but also mechanical disinfection in obstetric practice. We can find references to that effect in Fischer's often quoted lecture in 1918 and in Ch. Routh's lecture in London. It is also confirmed by Temesváry in his reminiscences about Semmelweis in 1918 [38].

It follows that, by the application of the Semmelweis discovery, all the menaces besetting the hospitals in those days, such as wound-fever, erysipelas, and other surgical infections could have been kept at bay.

Sauerbruch declares that Semmelweis had clearly recognized the significance of asepsis and it was only due to the shortsightedness of his contemporaries that his discovery had not been applied in surgery. It was only later, in the eighteen-eighties that it was adopted [39], as a result of Lister's teaching.

G. A. Wagner in a lecture at a conference of German surgeons in 1943 examined the question of responsibility for the reluctant introduction of Semmelweis's aseptic measures into operative obstetrics and surgery. Wagner is convinced that Semmelweis discovered asepsis. He believes that the Hungarian doctor because of his long silence was partly to blame that his measures were not introduced into surgery and also because Hebra and others propagated his doctrine in the wrong context. Wagner is also convinced that there was a third reason, i.e. surgeons have at all times looked down on obstetric science and practice [40].

The Semmelweis Tradition in Hungarian Surgery

Surgeons in general did not take much notice of Semmelweis's discovery, but there is ample evidence to confirm that his treatment was introduced into Hungarian surgery before Pasteur and Lister, as early as in 1858. János Balassa in his clinical practice scrupulously observed his principles with regard to asepsis. Semmelweis himself, in his gynaecological operations, introduced and applied the aseptic treatment. Vilmos Tauffer, in his memorial speech in 1918, had the following observation to make on the subject: "Semmelweis when operating always 'kept his hands clean' and in his clinic in Budapest he created an isolated 'septic and aseptic service', when the rest of the medical world had not even guessed its significance" [41].

It has been corroborated by two of Semmelweis's contemporaries, Frigyes Korányi and Imre Navratil, that János Balassa accepted the Semmelweis doctrine and made the use of the chlorine handwash compulsory in his clinic. As we have

mentioned earlier, Balassa acted as assistant to Semmelweis when he performed the first ovariotomy in Hungary on June 22nd, 1863 [42]. Later when Balassa performed ovariotomies on his own he followed the principle recommended by Semmelweis.

Walter Brunn also confirms that Balassa accepted the Semmelweis doctrine [43]. According to L. Schönbauer, "It is not at all true that Semmelweis was only interested in the prevention of puerperal fever; on the contrary he recognized its importance in relationship to wound infection in general. He applied his prophylactic measures when performing ovariotomies in Budapest with Balassa acting as assistant. The latter discussed Semmelweis's new measures in his clinic and followed his example in his operations" [44].

The aseptic treatment of Semmelweis was not disregarded in the University of Pest after the death of Balassa (1868) either: His immediate successor József Kovács and the latter's successor Gyula Dollinger strictly observed the tradition [45]. Dollinger, as it is confirmed by Podach, turned the chemical and mechanical disinfecting of the hands into a rigid cult [46].

The successor to Balassa's chair, József Kovács, who did not agree with the antiseptic method of Lister, consciously adopted the aseptic views as accepted by Balassa and developed them into a special aseptic treatment of wounds [47]. He soon discovered the toxic effect of the carbolic acid spray recommended by Lister and preferred the aseptic treatment of Semmelweis: Thus he made his operating implements germ-proof by steaming them and he abolished first carbolic acid and later mercuric chloride from his practice.

József Kovács always maintained that the most important factor in antiseptic surgery was cleanliness. At a meeting of Hungarian Physicians and Nature Researchers in Budapest in 1879 he gave a lecture entitled "Seven Cases of Ovariotomy" and, discussing various methods in wound treatment said: "For the last fifteen years, since we have accepted the Semmelweis doctrine, we stopped pursuing the old treatment of wounds according to which wound fever was not only necessary but desirable. Our surgical clinic has used antiseptic media ever since and has produced very good results."

He also explained in his lecture that he did not follow strictly the Lister method since in the Surgical Clinic of Budapest University the situation as regards wound treatment was very favourable. He also voiced his conviction that Lister's devout followers would soon give in as far as the rigid method was concerned.

In a lecture devoted to the memory of Balassa in 1906, a disciple of Kovács, Imre Réczey confirmed his master's views on asepsis: "...soon the constituent parts of the Lister bandage were modified, improved, simplified, and fifteen years later only the principle—surgical cleanliness—remained of both the bandage and the wound treatment. This was observed by József Kovács's critical eyes very early and he realized it being the essential element of the Lister bandage when his assistants demonstrated the new method in 1873" [49].

In his lecture devoted to the memory of József Kovács in 1907, Miksa Schächter, the renowned Hungarian medical journalist, said the following on the matter:

"We have to establish the historic truth that József Kovács was among the first to discover that the essential feature of modern wound treatment lay in aseptic conditions and not in the application of chemical media." He was despised, even persecuted for this view, but he is justified by the most modern opinions which do not approve of the use of antiseptic agents [50].

Gyula Dollinger, successor to Kovács, stressed in his memoirs that Kovács had introduced asepsis. He described his opposition to Lister's teachings as follows: "After a few applications of the complicated Lister dressing, Kovács declared it to be superfluous, and the carbolic acid spray, dangerous, and when others did not dare operate without the steam spray, he practised asepsis instead of antisepsis . . ." [51].

In his Semmelweis memorial speech in 1918, Vilmos Tauffer also referred to Kovács's attitude to the Semmelweis tradition: "We know for certain about József Kovács that he did not approve of the Lister method, finding the whole paraphernalia of the ceremony superfluous; but in the spirit of Semmelweis he insisted on absolute cleanliness in surgery although only in the every-day sense of the word, nevertheless with great success. So much so that he could afford to disregard Lister's cumbersome method of treatment."

H. Buess professed the view that, beside Balassa and members of his school, no other surgeon followed the advice of Semmelweis [52]. Ruth Brunn-Fahrni on the other hand maintains that Edmund Rose (1836–1914), Professor of Surgery in Zürich, who succeeded Billroth and held the chair between 1867 and 1881, adopted the chlorine disinfectant of Semmelweis and succeeded in defeating hospital infection which Billroth could not control [53]. Brunn-Fahrni's observation is confirmed by Alfred Brunner, who maintains that Krönlein (1849–1910), Rose's disciple and successor, had noted as a university student that Rose was among the few surgeons who applied the Semmelweis doctrine in surgical practice. After 1870, however, Rose abandoned the chlorine solution in favour of Lister's carbolic treatment [54].

Semmelweis or Lister?—Semmelweis and Lister

Neither Semmelweis nor Lister escaped their fate. Medical literature started to compare them and there were arguments in favour of one or the other—in the specific instance, who had more merits in the fight against infections.

In 1882 Hegar said: "Lister is less original than Semmelweis who had only himself to rely upon" [55].

Kussmaul shared the same view when saying: "His perspicacity deserves not less praise than the English surgeon. The latter could rely on the observations of Pasteur while Semmelweis had only his own clinical observations and post mortem findings at his disposal" [56].

Hueppe is also convinced that Semmelweis should be regarded as the father of aseptic wound treatment [57]. C. Brunner and E. Küster maintain that Semmel-

weis had worked out with great circumspection the prophylactic method of chemical and mechanical antisepsis in obstetrics [58]. Sigerist believes that Semmelweis was the first conscious representative of modern asepsis. Lister's aseptic measures in practical surgery had developed indirectly under Pasteur's influence, but the same had been achieved in Germany by Ernst Bergmann [59].

B. Menge expressed the view that Lister's teachings constituted a great setback as compared with the disregarded Semmelweis. "He encouraged us to concentrate our whole attention on the harmless and unimportant sources of infection and forget about the physician's hand, the most important and most dangerous source of infection both for the surgeon and the obstetrician" [60].

I. Fischer was obviously referring to Menge's observation when writing in 1918: "Although Lister is known to be the father of antisepsis, his practical treatment was called a setback as compared with Semmelweis's" [61].

There is little doubt that Lister in his antiseptic wound treatment concentrated on the disinfection of the operation area with a carbolic acid solution, i.e. on the atmosphere, not even mentioning the possibility of infection inherent in the examining hand which can transmit it directly.

According to Walter Brunn, as late as 1885 Lister still operated in a morning coat without as much as washing his hands. In his history of surgery he describes the following incident: "Privy Councillor Körner saw Lister in 1885 to alight from his carriage and proceed with operations applying lavish sprinkling of carbolic acid, but without washing his hands either before or between" [62].

Franz Bruck, who made strenuous efforts to convince the German surgeons that Semmelweis deserved more notice in the discovery of antisepsis and in the introduction of asepsis, made the witty remark that the basis of modern asepsis can be found in a statement made by Semmelweis. He was supposed to have said that it is safer if the obstetrician does not soil his fingers than if he cleans them after having soiled them [63].

Walter Brunn in his above-quoted book remarked that both for obstetrics and for surgery Semmelweis opened the doors of a new world, and was a great initiator in surgery as well. It is wrong to call him the precursor of Lister, because both in theory and in practice Semmelweis followed the right track and it was he who had laid down the principles of modern wound treatment. "Although Semmelweis's method was first applied in obstetrics, he had insisted that his teachings, rules and principles should be applied in surgery as well. Thus Semmelweis became, before the others, the founder of surgical asepsis . . . it is entirely wrong to stamp him as Lister's precursor only" [64].

Schönbauer endorses the opinion that, from the point of view of historical truth, it is wrong to call Semmelweis a mere forerunner of Lister as it is done by Lister's biographers. He seems to repeat verbatim Brunn's opinion: "We must regard Semmelweis as the actual founder of asepsis in surgery too; it would be wrong to stamp him as a mere forerunner of Lister" [65].

There is no doubt that the theoretical basis of the Semmelweis doctrine is right and valid even today, while Lister's aseptic treatment has undergone many

changes in the course of time. From everything Lister considered important, only the principle survived: the method was completely modified. Thiersch was the first to replace the poisonous carbolic acid with salicylic acid, which was followed by iodoform and the mercuric chloride dressing. Gone was also the spray with finally nothing remaining but surgical cleanliness. Lister himself did not abandon the carbolic acid spray until 1887 thus making it obvious that he considered it most important that the atmosphere should be disinfected. This is considered negligible today.

Ernst Küster expressed his admiration for Semmelweis in the following words: "It became more and more obvious that the best antiseptic agents could not prevent or control the outbreak of an acute disease, consequently it became recognized that the wounds themselves were not most threatened by the germs pervading the air as Lister seemed to believe, but the greatest danger lay, as recognized by the unfortunate Semmelweis, in contact infection inoculated by the insufficiently disinfected hands and fingers, and implements and dressings soiled by them" [66].

Walter Sigwart maintains that Semmelweis should be given due recognition as the father of asepsis and should not be placed beside Lister but above him, because twenty years before Lister he had clearly understood the relationship of the exogenous factors causing infection, practising also adequate disinfection [67].

Walter Schmitt admits that Lister's antiseptic treatment had removed the threat of wound infections after 1876, but the truth remains that as early as 1862 Semmelweis professed the principle of non-infection and introduced the disinfection of the hand and surgical implements [68].

Although indirectly and with many errors, Lister had finally defeated the enemy with his meticulous system, and had carried to triumph the principle which had been recognized twenty years earlier by Semmelweis—operating with clean hand, asepsis and non-infection.

The scientific truth is that Semmelweis ploughed the field for Lister to sow his seed in. It was also he who had laid down the foundation of antisepsis and asepsis, but the practical application of both is due to Lister.

Evidently Semmelweis was more than a mere forerunner of Lister, but it is equally true that the former's discovery owes its practical application even in obstetrics to Lister, since before him it was not introduced in general practice. Vilmos Müller has justly said that Lister carried Semmelweis's principles to victory, whereas Semmelweis had paved the way with his struggle for Lister's emergence [69].

Lister's activity opened the world's eyes so that it could see, appreciate and admire the genius of Semmelweis. Only after Lister's work done between 1863 and 1867, as a new treatment imported from England in the eighteen-seventies, did antisepsis enter obstetric practice as Listerism. Lister's teachings were hailed in Europe as entirely new conceptions, just as if Semmelweis had never existed at all [70].

W. Stoekel believes that only Lister's antisepsis based on Pasteur's observations had rendered the services whose usefulness had been recognized before in obstetrics but without being sufficiently appreciated [71]. Jakab Bruck shares the view that without Lister it would have taken a long time before Semmelweis's teaching would have come to its own [72].

The real greatness of Semmelweis was recognized too late when the principle of antisepsis had already been ousted by asepsis; in other words, when Lister's treatment had been perfected into the Semmelweis method.

"The fact", writes H. Fassbender, "that the Semmelweis doctrine based on incontestable numerical data could thrive only in the Listerian application, is one of the most incomprehensible mysteries in the history of obstetrics" [72].

In science the development and perfectioning of an idea has never been accomplished by one man alone. Semmelweis and Lister rank among the greatest benefactors of mankind. The unreasonable question: Semmelweis or Lister? can only be answered by the simple affirmative: Semmelweis and Lister.

Notes

1. Lister Centenary Celebrations in London. *Brit. Med. J.* (1927) pp. 683–695. The celebrations began in Glasgow on April 1st, 1927 and ended in Edinburgh on July 20th. At the Lister celebrations in London, Max Gruber, Professor of Public Health, Vienna 1891–1906, then Petternkofer's successor in Münich, 1906–1923, spoke highly of Lister's merits, remembering Semmelweis too. He was moreover the only one to do so at all the Lister celebrations in Glasgow, Edinburgh and London. E. Grosz, Az angol orvosok gyűlése és a Lister ünnep Edinburghban (The Meeting of English Physicians and the Lister Celebrations in Edinburgh). *OH* (1927) pp. 911–912.
2. Pasteur had to fight hard against Justus Liebig who, like most scientists in his days, looked upon all physiological functions as mere physical or chemical processes.
3. Joseph Lister (1827–1912), English surgeon, who introduced antisepsis into surgery.
4. *Lancet* (1867) *i*, pp. 362–369, 457–459; *ii*, pp. 95–96, 353–356, 668–669; ibid. (1870) *i*, pp. 4–6, 40–42.
5. James Paget (1814–1899), English surgical pathologist, member of the British Semmelweis Committee.
6. Otto Madelung (1846–1926), Professor of Surgery in the University of Strasbourg, Persönliche Erinnerungen an Joseph Lister. *Strassburger Medizinische Zeitung* (1912) pp. 55–60.
7. Gustav Adolf Neuber (1850–1932), German surgeon, one of those who introduced antisepsis and asepsis in Germany, *Die aseptische Wundbehandlung in meinen chirurgischen Privat-Hospitälern.* (Kiel, 1886).
8. J. Douglas Guthrie, Professor of Medical History in the University of Edinburgh, *Lord Lister. His Life and Doctrine.* (Edinburgh, 1949) p. 128.
9. R. Volkmann (1830–1889), Professor of Surgery in Halle from 1867 to 1889. Johann Nepomuk Nussbaum (1829–1890), Professor of Surgery in Munich, *Leitfaden zur antiseptischen Wundbehandlung mit Rücksicht auf ihren gegenwärtigen Standpunkt.* (Stuttgart, 1887).
10. Ernst Bergmann (1836–1906), Professor of Surgery in Berlin, founder of practical asepsis. His assistant, Kurt Schimelbusch (1860–1896), in *Anleitung zur aseptischen Wundbehandlung* (Berlin, 1892), deals with the technique of modern clinical disinfection. His 14-page bibliography does not contain even the name of Semmelweis.

11. Leopold Dittel (1816–1898), from 1865 Professor of Surgery in Vienna. Theodor Billroth, Professor in Vienna, did not accept the Listerian antiseptic wound treatment. He himself carried on researches on wound infection and came to the conclusion that the various microorganisms were the vegetation forms of *coccobacteria septica*, and the symptoms of various diseases were caused by chemical and physical processes in the tissues. Cf. *Versuch einer wissenschaftlichen Kritik der verschiedenen Methoden der aseptischen Wundbehandlung* (Wien, 1874); *Chirurgische Klinik Wien 1871–1876 nebst einem Gesamt-Bericht über die chirurgischen Kliniken in Zürich und Wien während der Jahre 1860–1876.* (Berlin, 1879).
12. "*Am 2. September 1894 gelegentlich des VIII. Internationalen Kongresses für Hygiene und Demographie in Budapest verlas Hueppe das bis dahin unbekannt gebliebene Schreiben Semmelweis an die Pester Akademie vom Jahre 1861 und zitierte zum Schlusse einen Ausspruch Listers: Ohne Semmelweis wäre mein Wirken ein nichtiges, dem grossen Sohne Ungarns verdankt die neue Chirurgie das Meiste!*" Cf. Schürer von Waldheim, op. cit. p. 245.
13. "*Als ich 1865 die Grundsätze der Antiseptik auf die Wundbehandlung anwandte, hatte ich Semmelweis Namen nie gehört und wusste nichts von seiner Arbeit. Als ich zwanzig Jahre später nach Budapest kam, wo ich von der Aerztschaft und den Studenten mit ausserordentlicher Freundlichkeit empfangen wurde, wurde der Name Semmelweis nie erwähnt, da er, wie es scheint, in seiner Geburtsstadt, wie in der ganzen Welt vollständig vergessen war. Erst einige Zeit danach wurde durch Dr. Duka, einen in London tätigen ungarischen Arzt, meine Aufmerksamkeit auf Semmelweis und sein Werk hingelenkt. Wenn aber auch Semmelweis auf mein Werk keinen Einfluss gehabt, so bewundere ich doch seine Arbeiten sehr und freue mich, dass sein Andenken endlich gebührend geehrt wird.*" O. Herff, Das Kindbettfieber. Vol. II. In: L. K. W. Winckel, *Handbuch der Geburtshilfe.* (Wiesbaden, 1906).
14. R. Goldhahn, *Spital und Arzt von einst bis jetzt.* (Stuttgart, 1940) p. 188.
15. *Népegészségügy* (*Popular Hygiene*) (1927) p. 1425.
16. "*Bei ruhiger Überlegung hatte er erkennen müssen, dass ein Umschwung der Anschauungen vieler Jahre nicht im Handumdrehen möglich, dass es überall besser geworden, wenn noch die Sonne nicht den Zenith erreicht hatte, um einen Lister zu weitigen, dessen Munde der Ausspruch entstammt: 'Ohne Semmelweis wäre mein Wirken ein nichtiges, dem grossen Sohne Ungarns verdankt die neue Chirurgie das Meiste!'*"
17. In Memoriam Semmelweis. *Budapesti Orvosi Ujság* (*Budapest Medical News*) (1911) pp. 83–89.
18. The statement attributed to Lister was repeated by O. Pertik in 1911, by I. Csapody in 1912, by R. Temesváry in 1918, by S. Fekete in 1957, by I. Domány in 1959 and by Gy. Magyary Kcssa in 1935. J. Bäcker (1864–1925), head of the obstetric department in a public hospital in Budapest, wrote in 1919: "... following Semmelweis's instructions the surgeons could have started the chlorine disinfection much before Lister, as it is an obvious fact that Semmelweis gave the first impetus to Lister which has been put into final shape by Pasteur and Lemaire." Lister's statement is repudiated by Hutyra in a lecture entitled "In Memoriam Lister" in 1923 and by Gyula Jáki in a treatise entitled "Theodor Billroth" in 1947. At the centenary celebrations of Lister's birth there were several statements in the Hungarian press, even in 1927, that Lister (after being informed by Duka about Semmelweis's activity) willingly recognized the priority of Semmelweis. This is confirmed by *Budapesti Hirlap* (*Budapest News*) on April 2nd, 1927 and by Izidor Révai in *Pesti Hirlap* (*Pest News*) on April 13th, 1927. Emil Grosz wrote in 1927: "Lister was a true friend of Hungary who recognized the priority of Semmelweis and the eternal doctrine of the great Hungarian." Cf. *OH* (1927) pp. 420–21. Gyula Magyary Kossa (1865–1944), Professor in the Veterinary Science College of Budapest, Corresponding Member of the Hungarian Academy of Sciences, medical historian, *Ungarische Medizinische Erinnerungen.* (Budapest, 1935) p. 294.
19. M. Wegscheider, Semmelweis und Lister. *Zentralblatt für Gynaekologie* (1924) pp. 356–57.
20. R. Truax, *Joseph Lister. Father of Modern Surgery.* (London, 1947) p. 270.
21. *Indian Lancet* (1860) pp. 35–36.

22. *Lancet* (1886) pp. 206–208, 246–249; op. cit. (Hertford, 1888).
23. V. Wallich, L'oeuvre de Pasteur et l'obstétrique. Séance solenelle du 26 Décembre 1922 à l'occasion du Centième Anniversaire de la Naissance de Pasteur. *Bulletin de l'Académie de Médecine* (1922) pp. 673–679.
24. Alexander Russel Simpson (nephew and successor to J. Y. Simpson), Letter to the Semmelweis Memorial Committee. Cf. *International Semmelweis Memorial Volume*, p. 90.
25. H. Varnier (1859–1903), French obstetrician, editor of *Annales de Gynécologie* and of *Revue d'Obstétrique et de Pédiatrie*. Cf. *Obstétrique Journalière, Paris* (1900) p. 325. F. J Hergott (1814–1907), Professor of Obstetrics in the University of Nancy, *Histoire de l'obstétrique par G. J. Siebold* (Paris, 1892) vol. III. Appendix, p. 250. A. Pinard (1844–1934), Professor of Obstetrics in Paris University.
26. Lister visited Austria for the third time in 1890 after the 10th International Conference of Physicians in Berlin, August 4–9, 1890. He spent a few days in the Tyrol. Cf. B. Juhn, Lister und Wien. *Wiener Med. Wschr.* (1961) pp. 101–102.
27. Sir Rickmann Godlee (1859–1925), *Lord Lister*. (Oxford, 1924).
28. V. Robinson, Pathfinders in Medicine. Semmelweis the Obstetrician. *Medical Review of Reviews, New York* (1912) pp. 232–246.
29. Archives of Semmelweis Memorial Committee in Hung. Med. Hist. Library.
30. Ö. Tuszkai, Semmelweis egy barátja Ch. F. Routh (A Friend of Semmelweis, Ch. F. Routh). *Gyógyászat* (*Medical Practice*) (1909) pp. 882–884.
31. The conversation reproduced by Tuszkai must have occurred to Lister when comparing his own successes with the laborious life of Semmelweis (cf. Note 20). Tuszkai maintains that the conversation had taken place a few weeks before the death of Routh. According to him, Routh died June 7th, 1908, at the age of 85. According to the *Journal of Obstetrics and Gynaecology of the British Empire*, Routh died on February 19th, 1909. No. 15, 1909 of the same periodical published a long obituary notice on Routh also dealing with his services rendered to Semmelweis in the propagation of his doctrine.
32. In 1883 Lister spent three weeks in Tátrafüred (health-resort in the Tatra mountains), but owing to rheumatic pains (gout) he had to stop for a week in Pozsony (today Bratislava). Subsequently he stayed in Budapest from October 4th to 6th, 1883. *OH* (1883) pp. 1040, 1063–64; *Gyógyászat* (*Medical Pract.*) pp. 629, 678; *Pester Medizinische-Chirurgische Presse* (1883) pp. 778, 844, 864, 865. J. Bencze, Mozaikok Markusovszky Lajos életéből (Reminiscences from the Life of Lajos Markusovszky), series of articles in *OH* (1958) pp. 69–71, 103–105, 139–142. According to Bencze, Lister spent in May 1880 a few days at Egerszeg, in county Vas. "Lister was surprised", wrote Bencze, "how poorly Semmelweis is remembered in his own country, and Markusovszky immediately hit on the thought of a Semmelweis memorial." As to this journey and Lister's statements there, no reference is available in Hungarian and the international literature. Not even Győry seems to know about it in his references to Lister's stay in Hungary. Cf. T. Győry, *Az orvostudományi kar története* (*History of the Medical Faculty*). pp. 193, 630. No mention is made of this journey in the Markusovszky memorial speech made by Frigyes Korányi in 1902, nor by any of Lister's biographers. The same attitude should be assumed about F. Pachner's remark in his book on Semmelweis, *Za zivoty matek, I. Ph. Semmelweis* (*For the Lives of the Mothers*). (Prague, 1959), who contends that "Lister stayed in Budapest in 1870" and "was much surprised how little the man was remembered who a few years earlier had worked there".
33. "*Harmlose Glossen über eine Festsitzung aus Budapest vom 16. Oktober.*"
34. "*Prof. Lister weilte vorige Wochen in Budapest und war dort Gegenstand warmer Ovationen. Wir fanden uns merkwürdig angemutet, dass in allen Berichten, die wir lasen, der Name Semmelweis auch mit keinem Wörtchen erwähnt wurde. Hätte die Budapester Facultät die Anwesenheit Lister's besser feiern können, als durch eine dem Namen des grössten und genialsten Wohltäters der leidenden Menschheit dargebrachte Huldigung? Was wäre passender gewesen, als wenn die Gelegenheit benützt worden wäre zur Gründung eines Denkmalfondes*

für Semmelweis: wie erhebend an der Spitze der Subscribenten den Namen Joseph Lister zu lesen. Sollte vielleicht Semmelweis den Magyaren nicht als vollwichtiger Landsman gelten, dass sie der stolzen Zierde ihrer Fakultät sich nicht erinnern wollen?"

35. Vilmos Manninger (1876–1945), Professor of Surgery, *A sebészet diadalútja* (*Triumph of Surgery*). (Budapest, 1938) p. 236.
36. Friedrich Wieger, Des moyens prophylactiques mis en usage au grand hôpital de Vienne contre l'apparition de la fièvre puerpérale. *La Gazette Médicale de Strasbourg* (1849) pp. 97–105. In his article Wieger gives a detailed description of Semmelweis's antiseptic treatment. According to him the nailbrush was part of it.
37. "*. . . nach Semmelweis Vorschlag eine Chlorkalklösung in ein offenes Gefäss (Lavoir) gebracht wurde, in welches alle anwesenden Studierenden ihre Hände einzutauchen und mit einer Nagelbürste zu reinigen hatten . . .*" Karl Braun, *Lehrbuch der Geburtshilfe mit Einschluss der operativen Therapeutik* (Wien, 1857) p. 273; Semmelweis, op. cit. p. 450.
38. E. F. Podach, Die Einführung der mechanischen Aseptik (Handbürste) durch Ph. Semmelweis. *Der Chirurg* (1951) p. 120; For Routh's lecture of Semmelweis, cf. Collected works (in German), p. 25; R. Temesváry: *Gyógyászat* (*Medical Practice*) (1918) p. 26.
39. Ferdinand Sauerbruch (1875–1951), Professor of Surgery, Berlin, founder of pulmonary surgery, Der Stand der klinischen und operativen Chirurgie. *Münchener Med. Wschr.* (1920) pp. 977–980.
40. Georg August Wagner (b. 1872), Professor of Obstetrics in Berlin University, Semmelweis und die Verhütung der pyogenen Infection. *Der Chirurg* (1934) pp. 276–283.
41. Emlékbeszéd Semmelweis Ignác Fülöp 100 éves születési évfordulója alkalmából (In Memoriam Ignác Fülöp Semmelweis on the Centenary of his Birth). *OH* (1918) p. 30.
42. Description of first ovariotomy in *OH* by István Báthory, Semmelweis's assistant, entitled: Egy elfajult petefészek daganat kiirtása (Destruction of a Degenerate Ovarian Cyst). *OH* (1863) pp. 883–886. Histological picture of post mortem examination described by K. Balogh, ibid. pp. 963–968.
43. Walter Brunn (1876–1952), from 1934 director of the Institute for Medical History of the University of Leipzig, Die Begründung der modernen Geburtshilfe und Gynäkologie von hundert Jahren. *Zentralblatt für Gynäkologie* (1947) p. 293.
44. "*Es entspricht nicht den Tatsachen wenn immer noch behauptet wird, dass Semmelweis ausschliesslich um die Verhütung des Kindbettfiebers zu tun gewesen sei; er hat vielmehr im Gegenteil die Bedeutung seiner Erkenntnis für das gesamte Gebiet der Wundinfektion voll erkannt. So hat er selbst Ovarietomien unter diesem Wundschutz ausgeführt, er hat den Chirurgen von Balassa in Budapest bei diesen Operationen assistieren lassen und dieser hat wiederum in der chirurgischen Klinik die neue Methode von Semmelweis vorgetragen und bei seinen Operationen befolgt.*" L. Schönbauer, Die Wundbehandlung, die Antisepsis und die Asepsis. *Beiträge zur Geschichte der Medizin* (Wien, 1948) p. 24.
45. Gyula Jáki (1898–1958) and Tivadar Hüttl (1884–1966), professors of surgery, share another opinion. "It seems", writes Jáki, "that even János Balassa did not utilize adequately in surgery the teachings of Semmelweis, although Balassa was not only a colleague of Semmelweis, but was also one of his best friends and acted as assistant in his gynaecological operations. In such cases the preparations followed Semmelweis's directives. Cf. Jáki, *Billroth Tivadar* (Debrecen, 1944) p. 61. Hüttl gives the following answer to the question why Balassa did not apply the Semmelweis doctrine in surgery: "In those days, the various branches of medicine acted separately and were not interested in each other's results." Cf. A sebgyógyítás irányelvei, tanulságai, Balassa idejében és napjainkban. (Aspects and Results in the Treatment of Wounds in Balassa's Days and Today). A Balassa Lecture. *Orvostudományi Közlemények* (*Medical Publications*) (1941) pp. 465–471, 501–507.
46. P. Erich Podach, Die Einführung der mechanischen Aseptik (Handbürste) durch I. Ph. Semmelweis. *Der Chirurg* (1951) pp. 120–122.
47. József Kovács (1832–1897), Professor of Surgery in Budapest University, 1870–1897. According to some, Kovács, by his reluctance to introduce the Listerian wound treatment

retarded the development of surgery in Hungary; according to others, it was he who discovered the essence of asepsis and by the scrupulous application of surgical cleanliness anticipated by many decades the method of antiseptic wound treatment. The technique of the Listerian wound treatment appeared first in Hungarian in a book written by Ákos Puky (1845–1905), lecturer at the 2nd Surgical Clinic directed by Prof. Sándor Lumniczer- *A sebek kezelése, különös tekintettel Lister antisepticus módszerére, s az asepsis után módosult és átalakult sebészi fogásokra, néhány kórtörténeti kísérletben* (*The Treatment of Wounds with Special Reference to Lister's Antiseptic Method and Certain Surgical Tricks Applied after the Introduction of Asepsis in Some Experiments*). (Budapest, 1879) p. 199. Kornél Chyzer, Kovács József és Poór Imre emléke (In Memoriam József Kovács and Imre Poór). *Gyógyászat* (*Medical Practice*) (1899) p. 650.

48. J. Kovács, Petefészektömlő kiirtás hét esete (Seven Cases of Ovariotomy). *Magyar Orvosok és Természetvizsgálók 1879. augusztus 29-től egész szeptember 2-ig Budapesten tartott XX. nagygyűlésének történeti vázlata és munkálatai* (*Historial Sketch and Activity of 20th General Meeting of Hungarian Physicians and Nature Researchers, August 29th—September 2nd, 1879*). (Budapest, 1880) p. 55.
49. Imre Réczey (1848–1913), Professor of Surgery in Budapest University, 1890–1913, A sebészet haladása (Progress in Surgery). *Gyógyászat* (*Med. Pract.*) (1906) pp. 710–715. Balassa's lecture in the Medical Society of Budapest, Oct. 15th, 1906, at 69th general meeting. *OH* (1906) pp. 963–971.
50. M. Schächter, Haladás és conservatismus az orvostudományban (Progress and Conservatism in Medicine). József Kovács Memorial Lecture. *A Magyar Orvosok és Természetvizsgálók 1907. aug. 25–29-ig Pozsonyban tartott XXXIV. vándorgyűlésének történeti vázlata és munkálatai* (*Historical Sketch and Activities of 34th Rover-Meeting of Hungarian Physicians and Nature Researchers, Pozsony, Aug. 25th—29th, 1907*). Ed. by P. Kerekes and L. Biró (Budapest, 1907) p. 326.
51. Gyula Dollinger (1849–1937), Professor of Surgery in Budapest University, 1897–1919. *80 esztendő életemből (1849–1829)* (*Eighty Years of My Life*). (Budapest, 1929) p. 91.
52. Heinrich Buess, medical historian and professor in University of Basel, Semmelweis und die Begründung der Asepsis in der Geburtshilfe. *Schweiz. Med. Wschr.* (1948) pp. 882–886.
53. R. Brunn-Fahrni, Ignaz Philip Semmelweis, ein Wegbereiter der Aseptik. *Ciba Zeitschrift* (1949) pp. 4380–4382.
54. Alfred Brunner (b. 1890), from 1941 Professor of Surgery at Zürich University, Rudolph Ulrich Krönlein. *Neue Zürcher Zeitung*, Oct. 28th, 1960.
55. "*Lister ist viel weniger original, als Semmelweis welcher alles aus sich geschöpft hat.*" Cf. Hegar, op. cit. p. 45.
56. "*Sein Scharfsinn verdient kein geringeres Lob als der des englischen Chirurgen. Dieser konnte sich auf Pasteurs Untersuchungen stützen, Semmelweis schöpfte einzig und allein aus der klinischen Beobachtung und dem anatomischen Befund.*" Cf. Kussmaul, *Jugenderinnerungen eines alten Arztes* (Stuttgart, 1899) p. 371.
57. F. Heuppe, *Ignaz Semmelweis. Festrede zur Feier der Enthüllung seines Denkmales.* (Berlin, 1894) p. 24.
58. Conrad Brunner (1859–1957), surgeon in Zürich, *Handbuch der Wundbehandlung* (Stuttgart, 1916) p. 722; Ernst Küster, *Geschichte der neueren deutschen Chirurgie.* (Stuttgart, 1915) p. 110.
59. Ignaz Philip Semmelweis. *Neue Zürcher Zeitung*, August 13th, 1918.
60. "*Lister machte in seinen Lehren dem lange verkannten Semmelweis gegenüber einen grossen Rückschritt. Er verleitete uns dazu, unwesentlichen und harmlosen Infektionsquellen unsere ganze Beachtung zu schenken und über diesen die für den Chirurgen sowohl wie für den Geburtshelfer wichtigste und gefährlichste Infektionsquelle die Handhaut des Arztes zu vernachlässigen.*" In: Winckel, *Handbuch der Geburtshilfe.* (Wiesbaden, 1903–1907) vol. I, Part II, p. 1198.
61. ". . . *Lister der zwar der Vater der Antiseptik genannt wird, der aber in seinem praktischen*

Vorgehen Semmelweis gegenüber sogar schon als Rückschrittler bezeichnet wurde." Cf. *Wiener Klin. Wschr.* (1918) p. 782.

62. "*Herr Geheimrat Körner noch in 1885 sah wie nach dem Verlassen seines Wagens unter beträchtlichem Aufwand von Carbolsäure Operationen ausführte, ohne sich vorher oder zwischendurch die Hände zu waschen.*" Cf. W. Brunn, *Kurze Geschichte der Chirurgie* (Berlin, 1928) p. 279.
63. F. Bruck, *Semmelweis der Begründer der Anti- und Aseptik. Ein Mahnruf an die Chirurgen Deutschlands*. (Berlin, 1921) p. 31.
64. "*Zwar wandte Semmelweis sein Verfahren auf die Geburtshilfe an, aber er wies doch deutlich hin, dass seine Gedanken und seine Lehre und seine Massnahmen genau so auf die Chirurgie Anwendung zu finden hätten. In einem grossen Fluge hat sich so Semmelweis zum Begründer der Aseptik emporgeschwungen, auch in der Chirurgie—aber es ist nicht richtig ihn etwa nur zum Vorläufer Listers stempeln zu wollen.*"
65. "*Semmelweis ist als eigentlicher Begründer der Asepsis anzusehen auch in der Chirurgie: es ist nicht richtig ihn etwa zum Vorläufer Listers stempeln zu wollen.*" Cf. Schönbauer, op. cit.
66. "*Mehr und mehr rang sich die Erkenntnis durch, dass auch die besten antiseptischen Mittel nicht imstande sein Krankheitserreger aus einer frischen Wunde fernzuhalten oder gänzlich und überall unschädlich zu machen, mehr und mehr aber auch die Einsicht, dass nicht, wie Lister gelehrt hatte, die in der Luft schwebenden Keime die Wunde am meisten bedrohen, sondern, dass im Sinne des unglücklichen Semmelweis, vor allen Dingen die Kontaktinfektion, die Einimpfung durch Berührung mit ungenügend entkeimten Finger, Werkzeugen und Verbandstoffen, die Hauptgefahr darstellte.*"
67. W. Sigwart (b. 1876), Professor of Obstetrics in the University of Frankfort, Biologie und Pathologie des Weibes. In: *Ein Handbuch der Frauenheilkunde und Geburtshilfe*. Ed. by J. Halban and L. Seitz. (Berlin, 1924–1929) vol. VIII, p. 451.
68. W. Schmitt, *Allgemeine Chirurgie*. (Leipzig, 1960) p. 619.
69. V. Müller, *A modern sebkezelési elvek kifejlődése* (*Development of the Principles for the Modern Treatments of Wounds*). Clinical Brochures (Budapest, 1903) No. 13, pp. 171–188, 224–270, 375–415.
70. Manninger objected to the statement that the doctrine of Semmelweis was verified only due to Lister's treatment. "Soon after the tragic death of Semmelweis his teachings were widely adopted in obstetric practice and it is entirely wrong to say that the doctrine has only been generally recognized through the Listerian application." Cf. *Az antisepticus és asepticus orvoslásmód története* (*History of the Antiseptic and Aseptic Treatment*). (Budapest, 1903) p. 155. Tauffer maintains, on the basis of his own experiences, that the teachings of Semmelweis were generally accepted at the end of the seventies in German obstetrics and gynaecology, much before Lister's time. "Hegar had adopted the Semmelweis doctrine not only in the obstetric practice of his clinic but in gynaecology too, much before the Listerian treatment was known." Memorial Speech, 1918, p. 22. Kézmárszky expressed the same view as follows: "Hardly had the brilliant scientist closed his eyes than a change set in in the attitude of medical circles. One by one, more physicians adhered to the principle . . ." Cf. *Hőgyes Emlékkönyv a budapesti kir. magyar tudományegyetem orvosi karának multjáról és jelenéről* (*In Honour of Hőgyes, Discussing the Past and Present of the Medical Faculty of the Royal Hungarian University of Sciences of Pest*). (Budapest, 1896) p. 602.
71. W. Stoeckel, Semmelweis. *Zentralblatt für Gynäkologie* (1925) p. 1725.
72. J. Bruck, *Ignác Fülöp Semmelweis*. (Budapest, 1885) p. 87.
73. H. Fassbender, *Geschichte der Geburtshilfe*. (Jena, 1906).

Chapter Ten

Triumph of the Semmelweis Doctrine

Bacteriology in support of the Semmelweis theory — The teachings of Semmelweis in Hungary — His teachings abroad — International Semmelweis Memorial Committee — Fritz Schürer von Waldheim's biography — International celebration in Budapest at the unveiling of the Semmelweis Memorial — The memory of Semmelweis has survived — Historic stature and significance of Semmelweis

Bacteriology in Support of the Semmelweis Theory

The Semmelweis theory, presented without any scientific paraphernalia and without a single chemical or laboratory test could not convince the obstetricians of his time as regards the identity of the "decomposed organic material". The older generation of obstetricians continued to insist on the epidemic origin of puerperal fever, but for the younger generation, better informed about new pathologic notions, concepts like miasma and *genius epidemicus* had lost their significance. Finally bacteriology came to their rescue to offer an explanation of the real nature of the decomposed organic material.

Strange as it may seem it was again the 1st Obstetric Clinic of Vienna which brought into perspective the possibility of discovering the bacteriological origin of puerperal fever. Karl Mayrhofer, assistant to Karl Braun of Vienna, discovered *vibriones* in the lochia and uterus of feverous puerperae and came to the conclusion that they must be responsible for puerperal fever.

Mayrhofer did not consider the primary function of the *vibriones* as pathogenic but rather their ferments [1]. He first thought that the *vibriones* floating in the air of the lying-in wards were responsible for the infection, but he soon came to the conclusion that the examining finger, not the atmosphere, was the carrier and took them into the female genital organs. Mayrhofer's theory was disproved by Hausmann who discovered the same *vibriones* in 1868 in the lochia of healthy lying-in patients and in the vaginal discharge of pregnant women [2].

Leon Coze and Victor Thimotée Feltz, disciples of J. A. Stoltz, discovered in 1868 in Strasbourg, almost simultaneously with Recklinghausen, Waldeyer, and Orth, chain-like bacteria in the blood of women who had died of puerperal fever [3]. The microorganism called after its arrangement Streptococcus was first grown by Pasteur in 1879 in a culture of the secretions and blood of sick puerperae [4].

After completing his experiments on the fermentation of beer Pasteur focussed his attention in 1876 on the study of infectious diseases. In collaboration with

the French gynaecologist Doléris [5] and the bacteriologists Chamberland, Joubert and Roux he prepared a pure culture from the blood and lochia of patients who died of puerperal fever and demonstrated it on March 11th, 1879 at the French Medical Academy, then on March 18th, and finally on May 3rd, 1880 at the *Académie Française*. Pasteur's most important publication on the subject, "*De la septicémie puerpérale*", appeared in the *Bulletin de l'Académie de Médecine* in 1879 [6].

Pasteur did not mention the name of Semmelweis nor had he read his works when he demonstrated Streptococci in the culture made from the blood and genital secretions of women who had died of puerperal fever.

Couvelaire described the meeting on March 11th, 1879 when he proclaimed his discovery of puerperal sepsis and Hervieux, doctor of the *Maternité*, interrupted him with the ironical remark that he feared that he would not live long enough to see the *vibriones* causing this fever. Pasteur replied at once, saying: "With the permission of the Academy, I wish to draw the pernicious microbe to which I attribute the cause of puerperal fever. I feel convinced that they are one kind of species of the microorganisms I have been studying since 1860 and which I have discovered to be present at so many occasions, appearing in globular chain-like formation."

At the next meeting of the Medical Academy on March 18th, Pasteur described two further cases. The following year he presented to the *Académie Française* five further cases on the basis of which he could produce his final evidence that Streptococcus was the infecting agent to cause puerperal fever.

The findings of Pasteur were soon corroborated by Widal, Bumm and Chavenau and proved by Th. Edwin Klebs in a work written on the pathogenesis of wound infection [7], and by Koch. It was first in 1865, when Semmelweis was no longer among the living, that Pasteur advanced the theory that diseases could be produced by microbes. But it was Koch who definitely showed that all infectious diseases were caused by specific microbes [8]. It was important to produce evidence in support of this theory because great scientists like Virchow and Billroth refused to believe the pathogenic nature of bacteria.

It was left to bacteriology to demonstrate the true nature of the decomposed organic material that Semmelweis had discovered as the cause of puerperal fever [9]. Herff, Zweifel, Schottmüller, Döderlein, Bumm and many others recognized that all one had to do to verify the Semmelweis theory in a modern context was to substitute the concept of "decomposed animal material" for that of "bacteria": "If we substitute the concept of animal organic material for that of the microbe, with the pertinent consequences added, we can also understand the definition of 'puerperal fever' as given by the benefactor of women. It can hold its ground even today and need not be supplanted by a better one" [10].

According to the bacteriological researches of Schottmüller, Döderlein and Winter on the aetiology of puerperal fever, the main pathogenic role is allotted to Streptococcus haemolyticus erysipelatos, with Staphylococcus aureus, the Bacterium coli and Bacterium phlegmones emphysematosae also contributing [11].

The advent of a new era in science and a new generation of doctors had to arise to clarify the truth of Semmelweis's doctrine and to give proper recognition to his pioneer work. The full understanding of the correctness of his teachings was not a matter of days, either in Hungary or in the medical circles of foreign countries.

The Teachings of Semmelweis in Hungary

As Semmelweis himself had stated, his theory had not produced unfavourable reactions in Hungary. Nevertheless it was not completely understood although as gynaecologist, university professor and scientist engaged in the service of progress he had not been denied the recognition he deserved. Tauffer repeatedly spoke of the devoted service and enthusiastic support of Semmelweis's colleagues, of Balassa, Hirschler, Wágner, Lumniczer and Markusovszky [12].

The full meaning of his discovery and the holy flame flickering in his soul were only understood completely by Markusovszky. This adds to the latter's greatness, immense courage and moral foresight.

There is no doubt that the attitude of the obstetric world abroad and, first of all, Vienna's calculated contempt of Semmelweis's theory did not fail to have an effect on the medical circles of Hungary. His voice did not elicit a true response even within the confines of this country, and the real significance of his epoch-making discovery regarding the aetiology and prevention of puerperal fever was only understood after his death.

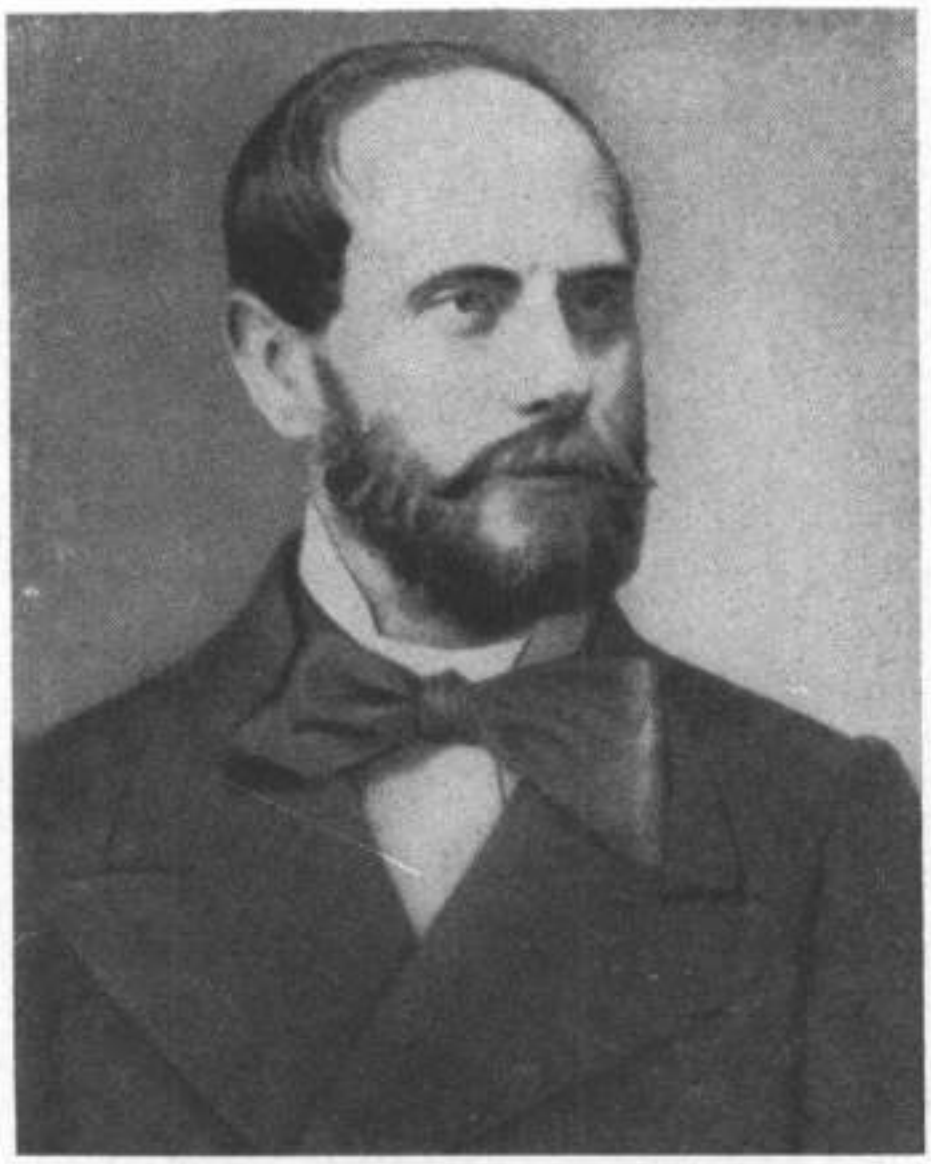
In 1906 Gusztáv Dirner, secretary of the Semmelweis Memorial Committee, expressed this view in an article entitled "Semmelweis": "... we know today that he belongs to us, and we knew it before too, but for a time—let us be quite frank about this—we had forgotten him completely. Did anybody hear the name of Semmelweis as much as mentioned in a university lecture throughout the seventies, or in the early eighties? Did anybody see his picture, his frowning brow, his searching eyes exhibited anywhere where it could have impressed the susceptible minds of the young generation of doctors? I have not heard his name nor seen his picture even when Lister's teachings reached us and the fumes of the carbolic acid spray made a curtain around the bed of the labouring woman. But at long last his name is heard again ..."

"Is it not one of the whims of fortune", said Kálmán Müller, "that Semmelweis died without rank, title or decorations? But at his feet rests the beautiful picture of motherhood, fixing her grateful eyes on the greatest benefactor of mankind, and will continue to do so to the edge of eternity" [13].

The Medical Society of Budapest instituted the practice of commemorating its deceased members by regular memorial speeches. It was only seven years after the death of Semmelweis that the first memorial speech was delivered.

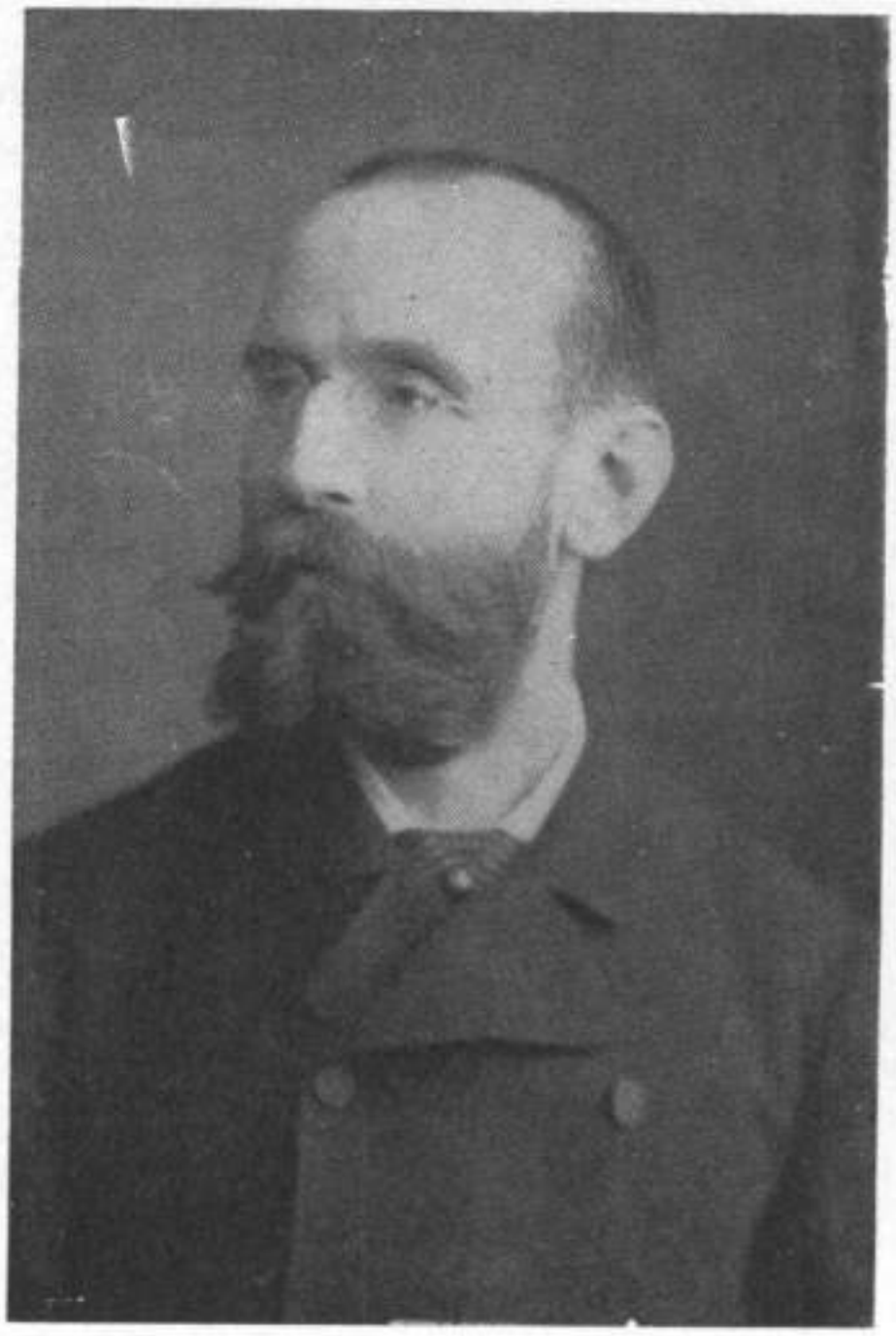
His former assistant, József Fleischer, head of department at Rochus Hospital, could not make his memorial speech (1872) "before time had exercised its moder-

ating effect on the minds of the survivors who have taken an active part in the fight over the discovery of the great master" [14]. Fleischer remembered the man, the teacher, the scientist, his activity in Rochus Hospital, his illness and the unjust attitude towards him. "Semmelweis", he declared, "never received the credit that was due to him, but posterity will re-pay its debt, his name will live for ever, because he has bequeathed a great truth to the world . . . which will be preserved so long as a single woman will survive to bear children". Fleischer maintained that "the key to the unjust treatment of Semmelweis must be looked for in the prevailing political conditions and in the strange mentality of the personalities who, in those days, were at the head of the medical council" [15].



József Fleischer

Kézmárszky says plainly that, had it not been for József Fleischer and János Ambró, the name of Semmelweis would have faded from the memory of all Hungarians after his death. János Ambró, Director of the Midwives' Training College in Pozsony never ceased referring to the merits of Semmelweis in lectures and articles, keeping his memory alive in the medical life of Hungary. In a lecture entitled "The Lying-in Hospitals and the Teachings of Prof. Semmelweis" held on January 8th, 1870 before the Medical Society, he declared himself a staunch adherent of the Semmelweis theory: "We have got to study the work of Semmelweis and propagate his teachings in every school so as to give a chance to the physician to learn their full impact in correct proportions". After the appearance of his book, in which he dealt with the idea of organizing training colleges for midwives, he was attacked in the journal *Medical Practice* by the Medical and Pharmacological Society of County Békés which protested against any commendation of Semmelweis's "theory of cadaveric poison": "However plausible the late Dr. Semmelweis's aetiology of the puerperal fever may seem at first sight, the question has remained undecided up to our own days in science. There are many among the gynaecologists who accept the theory of Semmelweis, but even more who reject it, admitting the possibility of infection as explained by Semmelweis, nevertheless not regarding cadaveric poisoning as the sole cause of puerperal fever. As the question has not been accepted in science, it was wrong of the author of the book to present it as incontestable, while declaring with apodictical certainty that the prophylactic measures must be observed in the training of mid-



Tivadar Kézmárszky

wives in order to prevent the outbreak of the ravages of the epidemic. It would have been enough to enumerate the measures necessary to ensure general hygiene in the lying-in hospitals, such as the purification of the air, the building of these hospitals on suitable, healthy sites, etc. While the author dwells lengthily on presenting Professor Semmelweis as the martyr of science, he only pays tribute to his memory without furthering his original aim with his comment. Therefore it can only be regarded as an aside" [16].

As late as 1871, there were instances even in Semmelweis's home country of the distorted interpretation of his teachings as a theory of cadaveric poisoning. The medical faculty of the university proved itself incapable of understanding the Semmelweis doctrine and proposed and appointed as his successor János Diescher (1813–1883). Diescher, who did not accept his doctrine, had held the chair of theoretical medicine and had lectured in the course organized for surgical students. There were eventually so many cases of puerperal fever in his clinic that he was unable to contain the situation, so that the medical faculty was obliged to ask for his resignation in 1874, appointing as his successor Tivadar Kézmárszky, a former student of Semmelweis.

"The spirit of Semmelweis was not evident in our university again", writes Tauffer, "until the appointment of his worthy successor, Kézmárszky in 1873. The present generation of doctors in Hungary, excepting the very youngest, are all former students of Kézmárszky, and we can all testify to his abilities as a great physician, an inspired teacher, a generous and unselfish man who with untiring efforts and great devotion instructed us how to spare the lives of labouring women and preserve their health, in the true spirit of Semmelweis. There is no living physician in Hungary at the moment who does not appreciate the activity of Kézmárszky in the Obstetric Clinic, dedicated to the spirit of Semmelweis" [17].

In Kézmárszky's handbook of obstetrics for midwives (1876) published both in Hungarian and German, the use of carbolic acid solution, soap and nailbrush is made compulsory in obstetric practice. Consequently obstetric prophylaxis has not been introduced in the lying-in clinics of Hungary before the mid-eighteen-seventies, coinciding with Kézmárszky's activity.

The efforts of Fleischer, Ambró and Kézmárszky did not remain unrewarded. In 1883 the Medical Society of Budapest appointed a Puerperal Commission under the chairmanship of Lajos Markusovszky, with Jakab Bruck, Tivadar Kézmárszky, Mór Liebmann and Vilmos Tauffer as members, with the object of drafting rules and instructions for the prophylaxis of puerperal fever in obstetric and midwifery practice, to be enforced by the Ministry of the Interior as a compulsory "disinfecting procedure". As a result of this the first official decree was issued in 1889. In 1891 the Puerperal Commission published its first long report concerning the state of obstetrics and midwifery throughout the whole country [18].


SEMMELWEIS IGNÁCZ FÜLÖP.

TANULMÁNY.

ÍRTA

Dr BRUCK JAKAB

KIADTA TAGJAI SZÁMÁRA

A MAGYAR ORVOSI KÖNYVKIADÓ-TÁRSULAT.

SEMMELWEIS ARCZKÉPPEL.

BUDAPEST.

FRANKLIN-TÁRSULAT KÖNYVNYOMDÁJA.

1887.

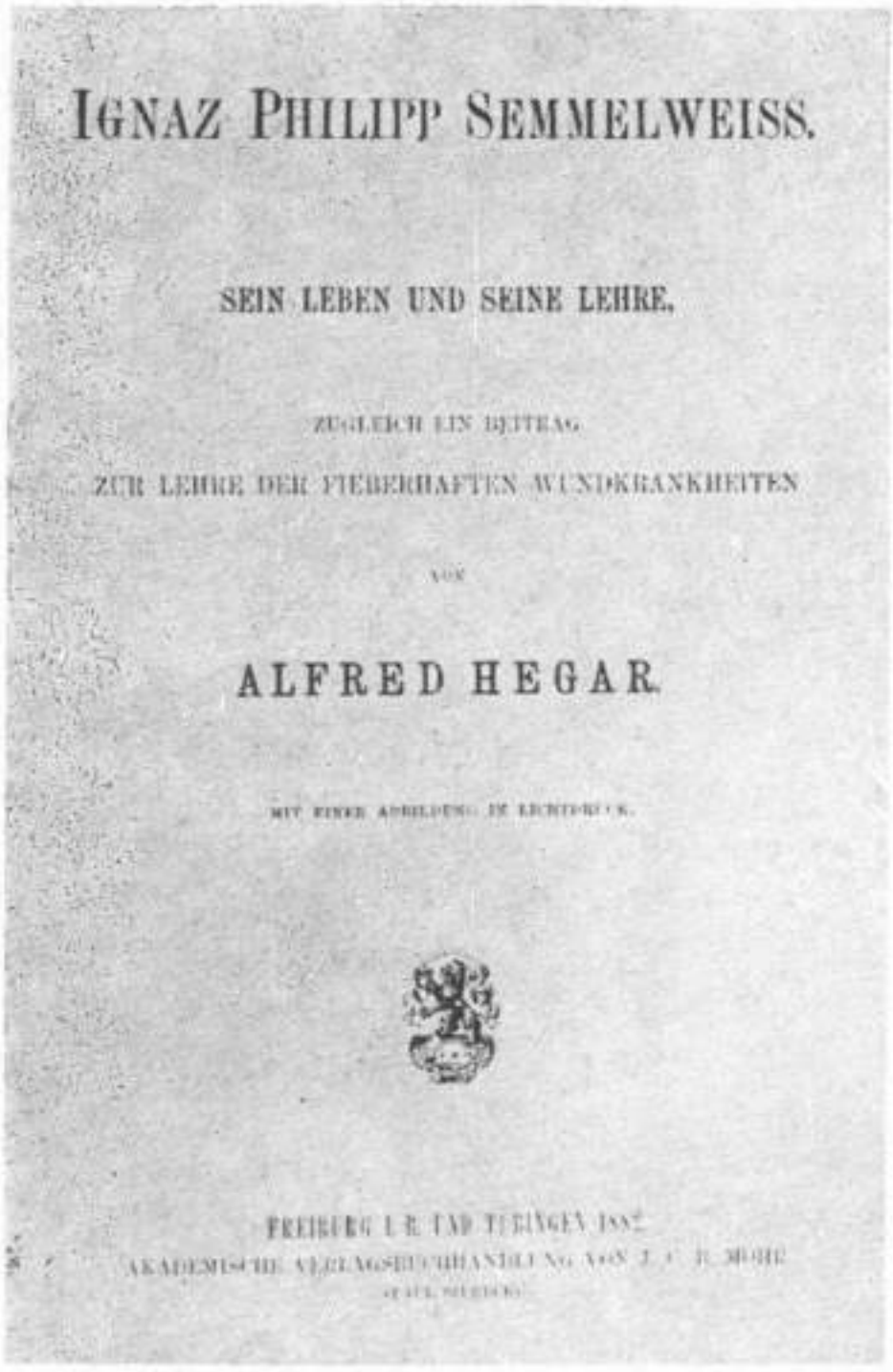
Jakab Bruck's Semmelweis monograph

The first milestone in the recognition of the merits of Semmelweis was the biography written by Jakab Bruck, a gynaecologist of Budapest. It came out 20 years after the death of Semmelweis and the material and particulars it contained were mainly furnished by his contemporaries. An enlarged edition was published in 1887 in German in Vienna, which became the main source of the foreign Semmelweis literature. As the book deals chiefly with his activity in Pest, it is not to be wondered that serious objections were raised in connection with Bruck's data concerning Semmelweis's activity in Vienna [19].

His Teachings Abroad

Asepsis in obstetrics emerged in Europe as the Listerian teaching was imported from England in the eighteen-seventies. It took a long time to recognize that the Listerian antiseptic treatment was, in broad outlines, the same as Semmelweis had uselessly propagated to deaf ears about five decades earlier.

The German obstetricians were the first to see the real significance of Semmelweis's discovery, and insisted that general acceptance should be given to it. First among these was A. C. Gustav Veit (1824–1903), Professor of Obstetrics at Bonn who had, in point of fact, already adopted Semmelweis's doctrine as early as 1865 [20]. In his book published in 1867 he devoted much space to the discussion


IGNAZ PHILIPP SEMMELWEISS.

SEIN LEBEN UND SEINE LEHRE.

ZUGLEICH EIN BEITRAG

ZUR LEHRE DER FIEBERHAFTEN WUNDKRANKHEITEN

VON

ALFRED HEGAR.

MIT EINER ABBILDUNG IM LICHTDRUCK.

FREIBURG I. B. UND TÜBINGEN 1882.

AKADEMISCHE VERLAGSBUCHHANDLUNG VON J. C. B. MOHR.

(PAUL SIEBECK.)

Hegar's Semmelweis biography

of the question of puerperal fever and commented as follows: "Finally Semmelweis . . . developed his theory professing that puerperal fever was an absorption fever caused by decomposed animal material. This interpretation has lately received general recognition and, within a short time, there will be little opposition to it" [21].

At the rover-meeting of German Physicians and Nature Researchers held at Giessen in 1864, Franz L. K. W. Winckel, Professor of Obstetrics in Munich, raised his voice in favour of Semmelweis. In 1866 he published his book entitled "The Aetiology and Treatment of Puerperal Fever" which appeared in several editions. Here the author adheres to the Semmelweis theory concerning the pathogenesis of puerperal fever [22].

Otto Spiegelberg, Professor of Obstetrics of Breslau, accepting the attitudes of Hirsch, Veit and Winckel in the question of puerperal fever, also adopts the Semmelweis doctrine: "What exactly is puerperal fever? . . . In the debates of the last two decades the teaching maintaining its infectious nature has won the day" [23].

Another enthusiastic supporter of Semmelweis's teaching was Veit's disciple, Karl Schroeder (1838–1887), obstetrician of Erlangen, later of Berlin. Schroeder insisted in 1871 that Semmelweis was one of the greatest benefactors of mankind, and the merit of discovering the aetiology of puerperal fever should go entirely to him. "The doctrine was invented by Semmelweis and he indeed deserves first place among the greatest benefactors of mankind. When it first appeared in 1847, as was immediately noticed, his theory was one-sided and insufficient, since it attributed puerperal fever only to cadaveric infection, but Semmelweis developed it adequately, and the ruling attitude concerning the aetiology of the disease must be altogether attributed to him" [24].

In 1877 the *Gesellschaft für Geburtshilfe und Gynäkologie* of Berlin sent out a commission under the chairmanship of Schroeder with Boer, public health officer, Fassbender, Martini and Löhlein, *Privat-docents* in obstetrics as its members to study the prophylactic measures of puerperal fever. The commission drew up a memorandum which accepted the teachings of Semmelweis as regards the aetiology and prophylaxis of puerperal fever.

"Germany", wrote Mór Liebmann in 1883, "which was late and reluctant to accept the blissful teachings of the bold, energetic and passionate reformer, Semmelweis, seems to atone for its former attitude by adopting whole-heartedly his preventive measures under state supervision" [25].

In the international literature Alfred Hegar, Professor of Obstetrics in Freiburg, was the first to dispel distorted and unfavourable views connected with Semmelweis [26]. Hegar's book was the first open international recognition of the correctness of Semmelweis's doctrine. He puts an end to the misconceived views concerning Semmelweis's theory of cadaveric poisoning and recognizes him as the initiator of aseptic wound treatment. Hegar is concerned with the question: Why could the simple and clear dogma not prevail even after Semmelweis's death when the waves of personal animosity had long subsided? He himself cannot understand it, and fully sympathizes with the despondency felt by Semmelweis, who was not led by vanity or any personal ambition but by humane feelings. "Glory to the ingenious brain", wrote Hegar, "which did not let itself be misled by prevailing views and methods but discovered an important and revealing truth. Glory to the noble-minded man whose compassion for the sufferings of mankind became the sheet anchor of the discovery of a great truth and its further development" [27].

Hegar had no other source for writing his biography except Fleischer's speech of 1872 in memory of Semmelweis and some notes of Ignác Hirschler prepared for him for the purpose [28].

Tauffer maintains that Hegar had accepted the teachings of Semmelweis in the eighteen-seventies and often discussed the tragic fate of Semmelweis with his students. In his article "Hegar's Works in the Semmelweis Spirit" he throws an interesting light on the preliminaries of Hegar's attitude to Semmelweis [29].

Heinrich Fritsch, an obstetrician of Breslau, confessed that it was incomprehensible to the younger generation of physicians why the Semmelweis theory had not been accepted. Antiseptic practice in obstetrics was taken over from surgical practice, although it should have been the other way round: Had Semmelweis's teachings been accepted, obstetrics would have come to the forefront of medical science [30].

In 1893 Winckel commemorated the services of Semmelweis in touching words at the launching of a subscription to an international fund for a Semmelweis memorial. He related how, with the permission of his chief, Professor Martin, the Semmelweis theory had been widely discussed in the university clinic of Berlin in 1861–62. When early in 1864 he was asked to run the university clinic of Rostock, he had found himself face to face with a local puerperal epidemic caused by a young assistant engaged in anatomical studies. Just a little earlier appeared Hirsch's favourable statement on Semmelweis, confirmed also by Professor Veit's approval of the Semmelweis doctrine. He himself was the first German clinicist to identify himself with it in May 1864, and by describing several clinical instances he vindicated the practical application of the Semmelweis theory [31].

At the time the German obstetricians had seized every opportunity to pay tribute to the memory of Semmelweis. From the 1895 Vienna Conference of the *Deutsche Gesellschaft für Gynäkologie*, several professors, among them Max Sänger of Prague, Gustav Veit of Bonn and A. S. G. Döderlein of Munich came straight to Budapest to place a wreath on the grave of Semmelweis [32].

At the 7th Conference of German Obstetricians, on June 11th, 1897, on the occasion of the fiftieth anniversary of Semmelweis's discovery, Paul Zweifel, who was the chairman of the conference delivered a memorial speech, and spoke highly of the vast services of Semmelweis, and called his discovery the most momentous scientific event inaugurating a new era in the history of medicine [33].

In England, James Y. Simpson, who at the beginning had taken a negative attitude, accepted the Semmelweis theory. The lecture of Arneth held in the Medical Society of Edinburgh in 1851 convinced Simpson of the correctness of the Semmelweis doctrine. At that time practically all English physicians approved Semmelweis's teachings [34]. Charles Routh was greatly responsible for the favourable reception of Semmelweis's ideas in England.

The generation of physicians after Simpson became more cautious, mainly under French influence and because of the unfavourable reaction among their German and Austrian colleagues. Simpson's firm support had long been forgotten, and at the Annual Conference of English Obstetricians under the chairmanship of Thomas Spencer Wells (1818–1897) held in 1875 not one single address identified puerperal fever with other cases of wound infection. At this conference, John Braxton-Hicks (1832–1897) and Robert Barnes (1817–1907) enumerated animal poison, emotional and traumatic factors, scarlet fever etc. as significant in the aetiology of puerperal fever. Robert Lee (1793–1877), on the other hand, spoke slightingly of the "German" Semmelweis and identified the contagionist conception with the aetiology of infectious sepsis [35].

Hegar, describing the discussion of English obstetricians and his own attitude towards the English views on Semmelweis's teaching, summed up his opinion as follows: "I have merely referred to the above in order to demonstrate the muddled state of affairs which existed with regard to puerperal fever on the other side of the Channel. The English physicians repeatedly stressed that the teachings of Semmelweis were well known in England. Anybody who followed closely the discussions of the English Obstetrical Society and the addresses on the relationship of puerperal fever and specific diseases (considering the former actually as an epidemic disease) will by no means prefer these obsolete views to the simple and clear teaching of Semmelweis" [36].

Nevertheless, English physicians did not abstain from the celebrations held in memory of Semmelweis in the eighteen-nineties and early 1900s. The president of the Semmelweis Memorial Committee, Spencer Wells, said about Semmelweis on October 24th, 1892: "The scheme to raise an international Semmelweis memorial is a noble one and we are pleased to support it . . . What Semmelweis had accomplished does not belong simply to medicine, to his country or to ours,

but to the whole world". As we have said above, Lister also warmly supported the work of the Semmelweis Memorial Committee.

France remained rather aloof. Friedrich Wieger, university professor of Strasbourg, who as assistant in Vienna in the eighteen-forties had become acquainted with the teachings and excellent results of Semmelweis, called the attention of the French experts to it as early as 1849. In the columns of *La Gazette Médicale de Strasbourg* (1849) he discussed at great length the activity of Semmelweis. His efforts proved futile and he could not convince even his chief, J. A. Stolz, Professor of Obstetrics at Strasbourg [37]. Arneth's lecture on Semmelweis's discovery and the method of defeating puerperal fever held before the French Medical Academy on January 7th, 1851 did not have any particular effect.

In France, Étienne Tarnier was considered the most progressive scientist. He took up his post in 1857 in the *Maternité* and became its director in 1867. Under Lister's influence, in 1871 he began to use carbolic acid in obstetric practice. In his first work on puerperal fever in 1857 he called the disease contagious and did not even mention the name of Semmelweis. In his book *Obstetric Asepsis and Antisepsis* he insisted that Semmelweis had only discovered half of the truth [38]. Tarnier attributed the discovery of the cause of puerperal fever to Samuel Kneeland, American physician (1825–1888), who published a paper in 1846 in which he said that puerperal fever was a contagious disease. The French believed for a long time that Tarnier was responsible for introducing the prophylaxis of puerperal fever [39].

Nevertheless there were many in France at the end of the century who paid tribute to the memory and activity of Semmelweis.

In his dissertation, G. F. J. Widal (1889) discussed the pathogenic role of Streptococci in the aetiology of puerperal fever. "Semmelweis first pointed out the methods of prevention in puerperal fever with such precision that modern antisepsis has nothing to add to the measures prescribed by him" [40].

In 1906 Adolphe Pinard commemorated the services of Semmelweis in a festive clinical lecture on the occasion of the unveiling of his monument, and said that Semmelweis certainly deserved to be mentioned among the greatest benefactors of mankind. In the same year he wrote: "Yes, the admiration I feel for Pasteur is boundless, and I am deeply indebted to Lister, Doléris, Chauveau and Arloing. I shall never forget their names nor the works of Ferdinand Widal, who revealed to us our most common enemies and opened new vistas. But it must be admitted that, through his discovery, Semmelweis was the first to throw light on what had been darkness before, offering to the physicians the methods of prevention which we are applying today in their full reality and completeness" [41].

We have quoted above Varnier's opinion, who attributed to Semmelweis the greatest results achieved for centuries in the fight for the prevention of puerperal fever. In 1951 Albert Nast remembered the name of Semmelweis with deep gratitude but still complains that he could not find his name in any of the French encyclopaedias he had consulted [42].

International Semmelweis Memorial Committee

On May 19th, 1891 Tivadar Kézmárszky, the successor and devoted supporter of Semmelweis forwarded a memorandum to the medical faculty of Budapest University suggesting the creation of a standing committee to foster the memory of Semmelweis and provide appropriate celebrations. Here, among others, he made the following comment: "Let us be quite frank: Lister needed tangible evidence to force the medical experts of the German nation to remember the discovery of a man who, though with inferior tools yet with infallible certainty, became the founder of asepsis—which the former arrived at by an inductive method and by means of the astutest researches of the modern world. It is to our greatest satisfaction that the scientific world of the German nation has become the staunchest supporter of Semmelweis and has paid worthy tribute to the memory of the great scholar by calling the aetiology of puerperal fever the Semmelweis doctrine" [43].

The medical faculty approved Kézmárszky's proposal and appointed a Semmelweis Memorial Committee in May 1891, with Tivadar Kézmárszky, Árpád Bókay, Imre Navratil and Vilmos Tauffer as its members. At the same time, at Rezső Temesváry's suggestion, the Medical Society of Budapest also established another Memorial Committee under the chairmanship of Frigyes Korányi. The two committees merged and decided to raise an international fund for the erection of a statue and memorial and to commemorate the house where Semmelweis was born, with a plaque.

The Memorial Committee issued an appeal first to the Hungarian physicians and then to those abroad, asking them to contribute to the international fund. From the participants a Hungarian and an international Committee were formed to foster the Semmelweis cult.

The earthly remains of Semmelweis resting in foreign soil were brought back to Hungary in the same year. They were exhumed by Semmelweis's widow from the Schmelz cemetery and arrived in Budapest on April 17th, 1891, where they were reburied in the mausoleum of the Walthier-family in the Kerepesi cemetery of Budapest (the mother of Semmelweis's wife came from the Walthier family).

Three years later, Semmelweis's remains were removed from the Walthier mausoleum and were placed in a special grave donated by the city authorities. The service was strictly private attended by the family, Prof. Kézmárszky, Prof. Tauffer and the chief public health officer, Dr. Adolf Scherman, representing the City of Budapest.

The Semmelweis Memorial Committee raised a sumptuous tombstone over the grave and arranged ceremonies there on the occasion of the International Conference of Demography and Public Health which met in Budapest in 1894.

It was at this conference on September 2nd, 1894 that F. H. Hueppe, Professor of Public Health in Prague, delivered his memorial speech quoted several times. He said that Semmelweis's significance could only be compared to that of Jenner



Semmelweis's tomb in the Kerepesi cemetery

and Lister. He stressed that his services extended far beyond the sphere of obstetrics and that Semmelweis should rightly be regarded as the real inventor of aseptic wound treatment [44].

On the same day the Semmelweis tombstone was also unveiled. The orators at the ceremony were Professor Kézmárszky, Theodor Duka, a Hungarian doctor resident in London, and the French professor, André Chantemesse. The latter in his address said that, if all the mothers and children who owed their lives and health to Semmelweis would be present at the ceremony, Budapest would have been small for their reception. The physicians of all nations bowed their

heads at the grave of Semmelweis, paying tribute to the great benefactor of mankind [45].

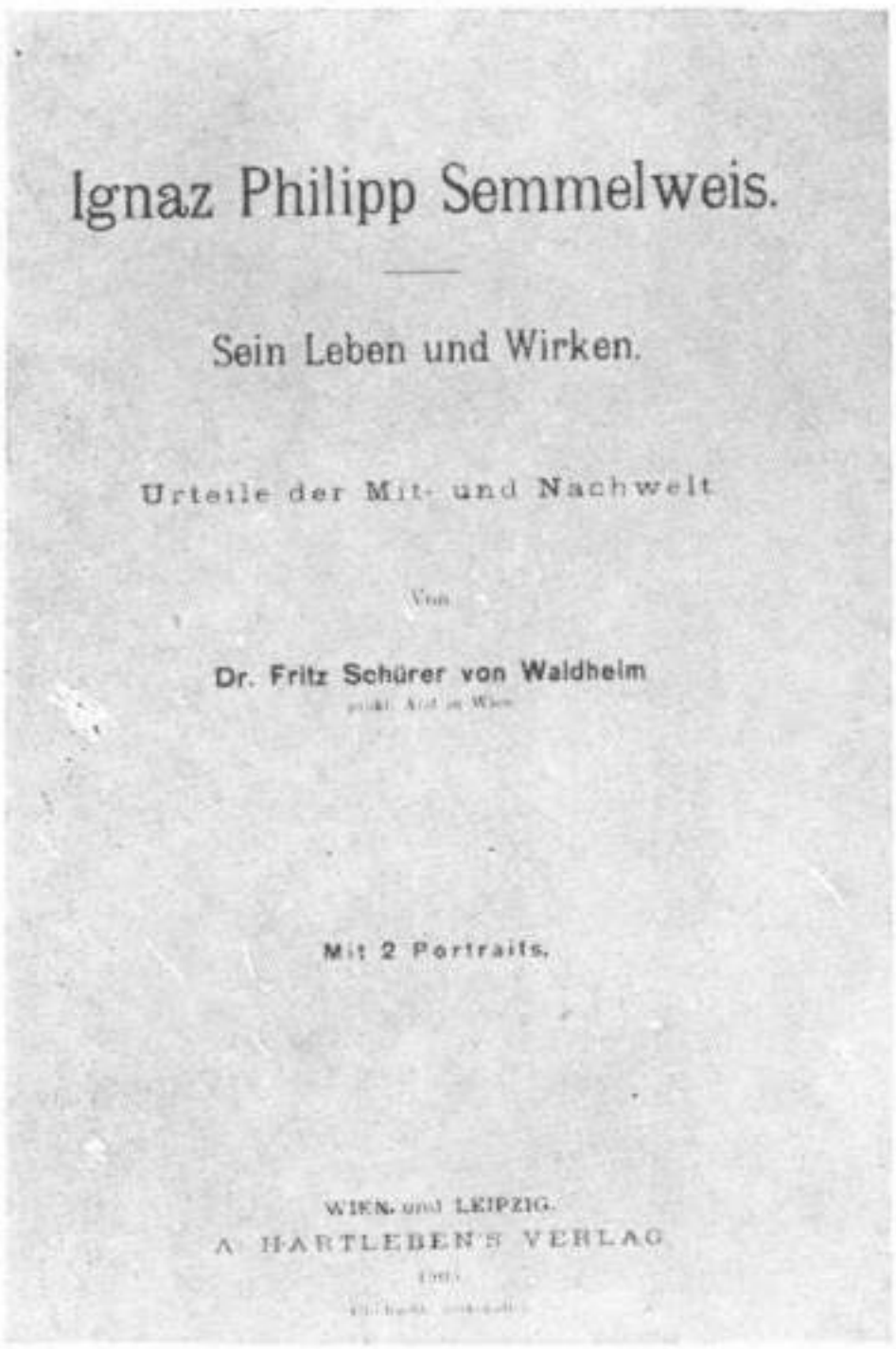
In 1900 the Hungarian Academy of Sciences also wished to commemorate the occasion by offering a prize to the best writer of a monograph on: "The History of Asepsis and Antisepsis, with Special Regard to the Activity of Semmelweis". The winner of the first prize was Vilmos Manninger [46].

Fritz Schürer von Waldl.eim's Biography

Nothing could dim Semmelweis's growing fame any longer. The activity of Baruch in the early years of the twentieth century must be regarded as an insignificant episcde. He tried in vain to deprive Semmelweis of the honour of priority and we have heard his arguments and Győry's reply.

Medical science in the twentieth century—both medicine proper and the science of medical history—has justified Semmelweis's theory, from a personal point of view giving him satisfaction as the man and also from the point of view of science.

In the recognition of his services from both points of view, the first great milestone, Fritz Schürer von Waldheim's biography, appeared in 1905 [47].


Ignaz Philipp Semmelweis.

Sein Leben und Wirken.

Urteile der Mit- und Nachwelt

Von

Dr. Fritz Schürer von Waldheim

Mit 2 Portraits.

WIEN und LEIPZIG.
A. HARTLEBEN'S VERLAG

Schürer von Waldheim's Semmelweis biography

When writing his biography, Schürer made use of the best sources: the archives of the university of Vienna and of the Ministry of Public Education; information obtained from the widow of Semmelweis; the notes of Semmelweis's friend, Ignác Hirschler, made for Hegar; and various items remembered by Hofrath Arneth and Hebra's widow. The author committed himself unreservedly to the cause of Semmelweis's priority as we have mentioned in Chapter Eight. He reproached just as passionately as Semmelweis in his own time had done those who in a cowardly manner set themselves in the path of Semmelweis and he paid a worthy tribute to the memory of the three great Viennese physicians, Hebra, Skoda and Rokitansky, who had recognized the

value of Semmelweis's discovery and had stood up for him. Schürer reveals all the indignities that Semmelweis had to suffer in Vienna, the injuries he received from his contemporaries past and present. "How did Vienna and Austria show their gratitude for the blessing? By forgetting him . . . the English people proved their gratitude to Jenner by the donation of a national fund of 30,000 pounds and 34 years after his death in 1857 a statue was erected in his honour in Trafalgar Square in London. In Austria up to the present day no one has raised a finger and not a single penny has been collected. The debt to be payed back is enormous" [48].

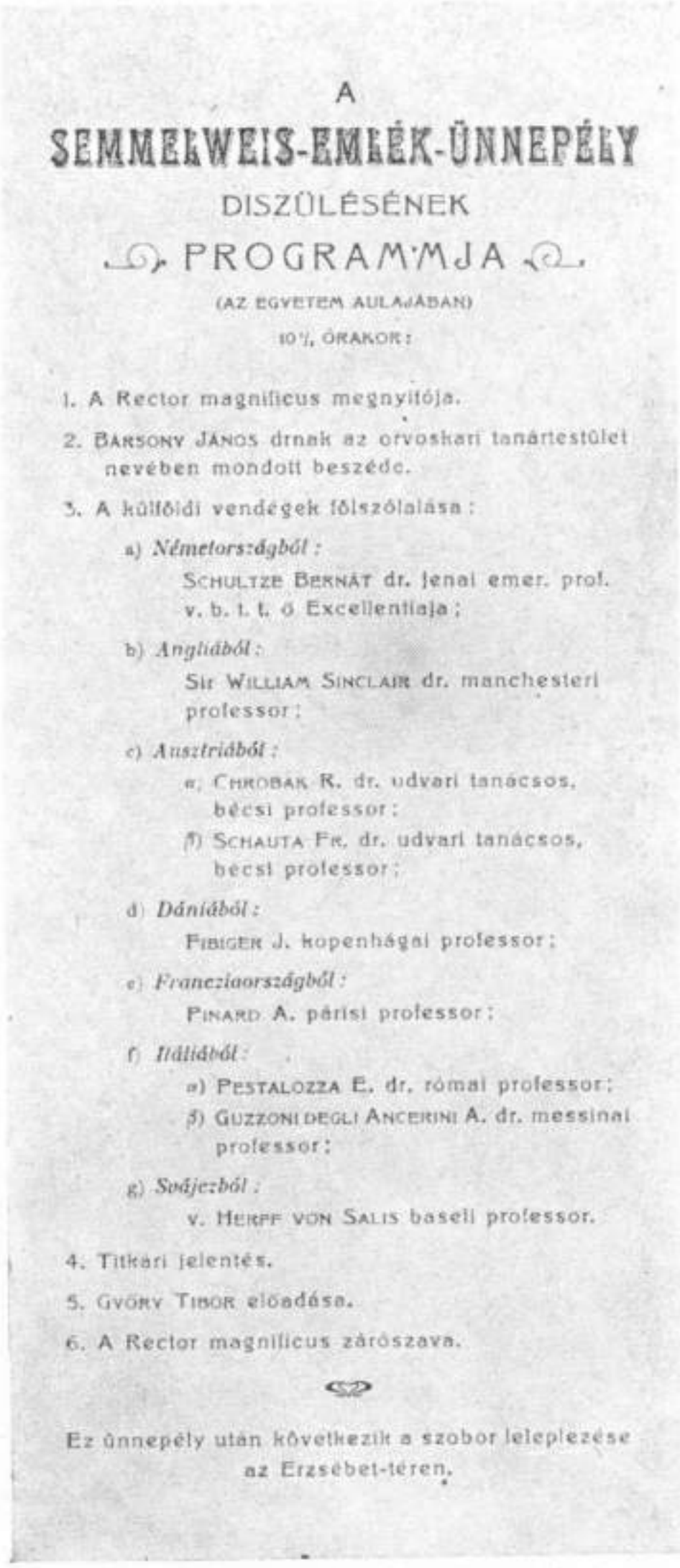
Schürer von Waldheim's biography is not without mistakes. We have already mentioned that he thought that Semmelweis was an Austrian by origin. The apocryphal statement attributed to Lister appeared for the first time in the world Semmelweis literature in this book. Nevertheless, in spite of its deficiencies, it pays worthy tribute to Semmelweis allotting to him his due place in human history and in medical science.

International Celebration in Budapest at the Unveiling of the Semmelweis Memorial

The year following the appearance of Schürer von Waldheim's biography was marked by the full moral recognition of Semmelweis when on September 30th, 1906 amidst solemn celebrations the Semmelweis memorial erected through international funds was unveiled in Budapest.

On the eve of the unveiling ceremony, September 29th, the Medical Society of Budapest held a festive session, opened by Professor Árpád Bókay of Budapest, chairman of the Society.

"We are commemorating", he said, "the eve of the unveiling of the Sem-



A

SEMMELWEIS-EMLÉK-ÜNNEPÉLY

DISZÜLÉSÉNEK

PROGRAMMJA

(AZ EGYETEM AULÁJÁBAN)

10½ ÓRAKOR:

1. A Rector magnificus megnyitója.
2. Bársony János drnak az orvosikari tanártestület nevében mondott beszéde.
3. A külföldi vendégek fölszólalása:
   a) *Németországból:*
      Schultze Bernát dr. jenai emer. prof. v. b. t. t. ő Excellentiája;
   b) *Angliából:*
      Sir William Sinclair dr. manchesteri professor;
   c) *Ausztriából:*
      α) Chrobak R. dr. udvari tanácsos, bécsi professor;
      β) Schauta Fr. dr. udvari tanácsos, bécsi professor;
   d) *Dániából:*
      Fibiger J. kopenhágai professor;
   e) *Franciaországból:*
      Pinard A. párisi professor;
   f) *Itáliából:*
      α) Pestalozza E. dr. római professor;
      β) Guzzoni degli Ancerini A. dr. messinai professor;
   g) *Svájczból:*
      v. Herff von Salis baseli professor.
4. Titkári jelentés.
5. Gyory Tibor előadása.
6. A Rector magnificus zárószava.

Ez ünnepély után következik a szobor leleplezése az Erzsébet-téren.

Programme of the festive meeting at the university

A SEMMELWEIS-SZOBOR
ÜNNEPÉLYES LELEPLEZÉSÉNEK
SORRENDJE

* * *

I. Díszülés a Tud. Egyetem aulájában

(Kezdődik délelőtt 10 óra 30 perckor)

a) a *Rector magnificus* megnyitó-beszéde;
b) a budapesti egyetem orvosi tanári kara nevében szól *Bársony János dr.*;
c) felszólalás a *külföldi vendégek* részéről;
d) *György Tibor dr.* előadása;
e) a *Rector Magnificus* zárszava.

II. A szobor leleplezése az Erzsébet-téren

(Déli 12 órakor)

a) a Semmelweis-emlék végrehajtó-bizottságának *elnöke* ismerteti a szobor létesülésének történetét, leleplezi azt, s átadja Budapest székesfőváros főhatósága képviselőjének; egyúttal átnyujtja neki az ünnep emlékére készült dombormüvü érmet is;
b) a szobormu átvétele a székesfővaros nevében;
c) a koszorúk elhelyezése. Hymnusz.

A szobor-leleplezés után a *Semmelweis szülőházat* megjelölő *emléktábla* leleplezése és felavatása Budán, az Apród-utcza 3. száma alatt.

Programme of the inauguration of the Semmelweis memorial

melweis memorial. This is a festive occasion and we have every right to be proud that Semmelweis was once a member here. When our prophet, disillusioned and misunderstood in Vienna, came to Pest, he immediately joined our Society and remained an active member until his tragic death. The members of this Society, our predecessors, lent an understanding ear to him, and his teaching was adopted not only by the university and the public hospital but also by the excellent members of the Balassa circle who at that time were running our Society; they supported Semmelweis whole-heartedly with affection and encouragement. Balassa, János Wágner, János Bókay endeavoured to make up for the loss of the friendship of Skoda, Hebra and Brücke. But above all Lajos Markusovszky, then a young man teeming with energy, dedicated himself to the task of gaining recognition for the teachings of Semmelweis both at home and abroad.

"There is another good reason for holding our festive meeting tonight: it was on January 2nd, 1858 that Semmelweis started his series of lectures in our Society on the aetiology of puerperal fever which was then taking its final shape. While the text of his swan song in Vienna, his lecture held in the Medical Society there on May 15th, 1850, never appeared in print, and only corrupt minutes of it survived, the series of lectures held in our Society were written down and published in the *Medical Weekly*".

This address was followed by a lecture by Tibor Győry, who reviewed Semmelweis's past career, and the fate of his discovery. Placing his debates with his adversaries into proper perspective, he defended the originality of Semmelweis's doctrine and described his last illness.

On the following day, on September 30th, 1906, before the unveiling ceremony, a festive meeting was held in the hall of the University of Sciences at 10·30 a.m. at which the faculties of the university, the representatives of the medical authorities, the members of the Semmelweis Memorial Committee, the Semmelweis family and many foreign visitors were present. From the Semmelweis family the following persons attended: his widow, his unmarried daughter Margit, his married daughter Antonia—Mrs. Kálmán Lehoczky—with her four children, his sister, Julia—Mrs. Péter Ráth—with her son and grandchild, his nephew, Kálmán Müller, president of the Hungarian Council for Public Health.

After the opening address of the rector, Sándor Ajtai Kovács, the director of the 1st Obstetric Clinic, János Bársony discussed the significance of the teachings of Semmelweis and also many foreign delegates addressed the meeting [49].

B. Siegmund Schultze, privy councillor and university professor, spoke in the name of the university of Jena and the German obstetric and medical societies. He ended his speech with these words: "Let me also mention that I am one of those few happy individuals who have had the pleasure of meeting Semmelweis in person. When spending some time in Vienna in the early sixties, I came over here to Budapest to pay my respects to the man whom I honoured so highly" [50].

The meeting was next addressed by Prof. Robert Chrobak in the name of the medical faculty of Vienna University and the Medical Society of Vienna, who said that things would have turned out differently, had the school of Vienna not

misunderstood its own disciple. By way of amends it will mean little as far as the past is concerned that the new obstetric clinic will have a Semmelweis statue in its precincts in the coming academic term. He expressed homage to the spirit of Semmelweis in the name of the Gynaecological Society of Vienna and also in the name of the greatest medical society, the Imperial and Royal Society of

PROGRAMME DE L'INAUGURATION DU
□ MONUMENT SEMMELWEIS □

• • •

I. Séance solennelle dans l'Aula de l'Université
(IV., Egyetem-tér 1, à 10 h. 30 m. a. m.)

1. *Discours* d'ouverture, par le *Rector magnificus.*
2. *Discours* du *Dr. I. Bársony,* professeur, en représentation de la faculté de Médecine de l'Université Budapest.
3. *Discours* des p. t. *Hôtes étrangers.*
4. *Conférence* du *Dr. Tiberius de Györy* Privat-docent.
5. *Conclusion* par le *Rector Magnificus.*

II. Inauguration du Monument
Place Erzsébet (V., Erzsébet-Deáktér à midi préc).

1. *Le président du Comité exécutif* fait connaitre l'histoire du Monument, l'inaugure et le rend au *Représentant de la Municipalité* de la capitale, et lui transmet aussi la Medaille faite en mémoire du jour de la fête.
2. *Acceptation* du monument par le Magistrat de la Capitale.
3. *Deposition* des Couronnes. Hymne.

L'inauguration du Monument sera suivie par celle *de la table commémorative* à la maison natale de *Semmelweis.* (I. Apród-utca 3.)

Programme of the inauguration of the Semmelweis memorial

Physicians, which, in the time of Semmelweis, was the representative organ and the soul of scientific life. There Semmelweis had staunch supporters when everybody else misrepresented his teachings [51].

Professor Franz Schauta, director of the Vienna hospital where the momentous doctrine was born said: "It cannot be regarded as a coincidence that the Semmelweis theory first saw light in the obstetric clinic of Vienna. At the time when Semmelweis worked there, he could not seek support in bacteriology which did not exist yet but only in statistical evidence to prove his point. Statistical data,

on the other hand, are only convincing when there are many cases available. There was no other clinic in the world which could provide those data for Semmelweis except the Vienna clinic. At the time when the hero of our celebrations made his discovery, the clinic looked back on 63 years of activity with 186,000 cases of childbirth. But it was left to the genius of Semmelweis to let the dead numbers tell their tale . . . There is nobody today who will doubt the correctness of the Semmelweis discovery . . . The results we are achieving today with the application and development of his teachings in our clinics surpass even his wildest dreams. . . . We have known for long in Vienna that we owe a debt of gratitude to Semmelweis, and we have not forgotten to do our duty" [52].

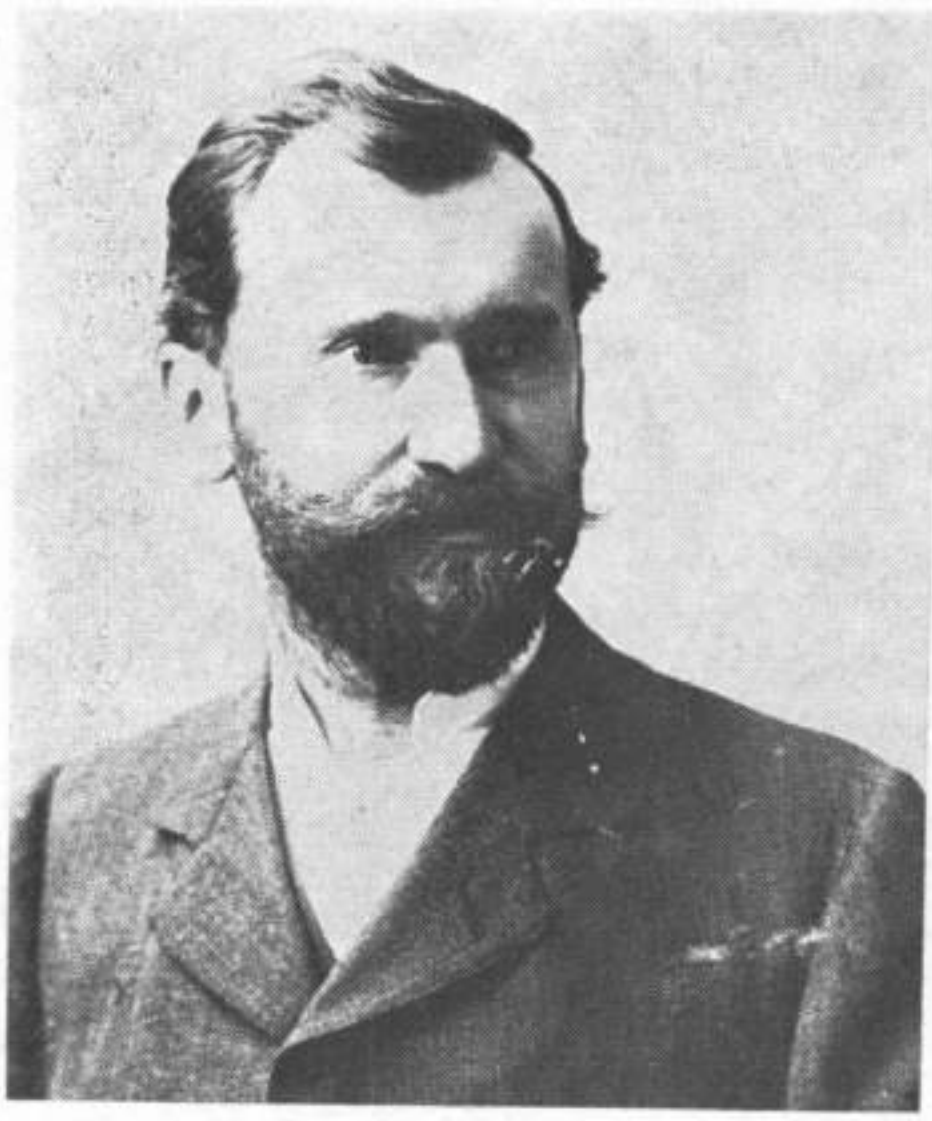
Next in turn Prof. Fibiger, anatomist and pathologist, spoke about the great fame of Semmelweis in his country, Denmark [53]. He was followed by E. Pestalozza, Professor of Obstetrics in Rome, who paid his tribute in these words: "In Italy, as in the other universities of the cultured world, the study of antisepsis begins with the name of Semmelweis. The disregard of his contemporaries which poisoned the life of our great apostle has changed into general respect and recognition: From every part of the world the brains of every learned centre turn now towards Hungary, enabling also myself as the representative of the universities of Rome, Florence, Milan, Pavia, Pisa and Parma to pay my homage to the noble University of Budapest and to the memory of Semmelweis" [54].

Prof. Herff of Basel University made it a point to stress that the University of Zürich was the first to recognize the importance of the doctrine. "Switzerland has a special duty towards Semmelweis", said Prof. Herff, "since it was the first country in which his teachings took firm root. Prof. Bischoff of Switzerland became a staunch adherent of the doctrine and, as far as the humble means at his disposal permitted, he endeavoured to introduce the teachings of Semmelweis in practice. The small seeds sown at the time for the prevention of the disease have grown since then into big trees, producing bountiful crop of fruit. Basel in particular has remained loyal to the Semmelweis tradition, and has tried to inculcate his teachings at all costs, so that today there is no obstetrical institution in my country which does not have the closest co-operation between the authorities, the physicians and the midwives in the successful prevention of puerperal fever" [55].

The secretary of the Semmelweis Memorial Committee, Gusztáv, Dirner, rose in the course of the festive session to read the letters and telegrams of greetings from foreign countries which had arrived by post. The last item on the celebration programme was a lecture delivered by Tibor Győry.

Beside the personalities mentioned above, many well-known foreign physicians attended, among others: Fritz Schürer von Waldheim, Julius Neuman, Joseph Halban, Ignaz Fischer, Antony Duka (son of Theodor Duka), Herzfelder, Mandl and Laczkó *Privat-docents* from Vienna, and others.

Sinclair, Routh, then 85 years old, and the 77 years old Hegar excused themselves for not being able to attend the celebrations in letters addressed to the Semmelweis Memorial Committee.



Vilmos Tauffer

In his letter Sinclair stressed his high regard for the activity of Semmelweis and declared that the cultured world owed deep respect to the memory of Semmelweis, which had been denied to him when alive for the discovery of the cause of puerperal fever.

Among others, we read the following in Routh's letter: "I feel few greater men have lived in our profession. He has given the means of saving the lives of thousands of lying-in women... in the world and their offsprings. Personally I feel that no words can express my gratitude and admiration of the man, by whose friendship and knowledge I was taught. I fully reported his discovery in a paper I read before the Royal Medico-Surgical Society of London in 1848. I gave the entire honour of the great discovery to Dr. Semmelweis ... Deeply was I moved to find a few men who had not fully appreciated Dr. Semmelweis's discovery then, but now it is admitted by all medical men".

After the festive session the participants went over to Erzsébet Square for the unveiling of the memorial. Before the unveiling ceremony the chairman of the Semmelweis Memorial Committee, Vilmos Tauffer, delivered his festive speech: "... Ignác Semmelweis was one of the greatest benefactors of mankind; there is no family in the cultured world who has not benefited from the blessings of his great discovery. His fate however was to succumb to the hardships he had suffered during the fights for the justice of his discovery, to lose his mental balance and to die broken hearted.

"There were few to understand the theory of Semmelweis during his arduous life; it was regarded as issuing from a deranged mind by the greatest experts of the time, while the rest shrugged their shoulders. A new age had to be born in science and a new generation had to grow up for the full appreciation of the great truth to which there is hardly a family amongst us that does not owe its happiness, the life of a mother, a wife, a daughter who has become a mother, and so forth. Before Semmelweis, the life of every woman in the loftiest hour of her vocation was at stake; he himself could never obliterate from his mind the vision of more than 30 mothers out of a hundred lying in the dreadful predicament of puerperal fever.

"I appeal to the spirit of Semmelweis to look down upon us at this moment! Look and see that all the physicians of the cultured world beg for forgiveness for the pains you have suffered and offer you the laurels for your great discovery. Look around and note amongst us the greatest representatives of your nation



The Semmelweis memorial (by Alajos Stróbl)

who are all proud of you for bringing glory to Hungary and to her people . . . This day will shine in the cultural history of the Hungarian nation when the scholarly representatives of the cultured nations of Europe came here on pilgrimage to pay homage to the spirit of our great countryman, to place their wreaths at the foot of your statue in recognition of your greatness".

After these words, the masterpiece of the sculptor Alajos Stróbl was unveiled, revealing the statue of Semmelweis carved from white marble. The main figure, Semmelweis, is holding his book in his hand. On the pedestal of the statue, a mother is sitting with a baby in her arms, raising her grateful eyes towards Semmelweis [56].

To commemorate the occasion of the unveiling ceremony, the Memorial Commission issued silver and bronze memorial tablets of Semmelweis, the workmanship of the sculptor Lajos Berán.

After the unveiling ceremony, the participants proceeded to the house where Semmelweis was born to place a plaque on the wall with the inscription: "Ignác Fülöp Semmelweis, Professor of Medicine, the saviour of mothers, was born here on July 1st, 1818".

Both as far as content and formalities were concerned the celebrations constituted a worthy tribute to Semmelweis. Their impact on the Hungarian public was of immense importance, because they showed that the discovery of a great Hungarian doctor had achieved world-fame.

The Memory of Semmelweis has Survived

The Semmelweis cult expanded further and further. The Doctor's Casino established in 1896, for long decades under the chairmanship of Rezső Temesváry, uniting the practitioners of Budapest in one organization, founded the Semmelweis Cup in 1907 [57]. Year after year at the famous Semmelweis Cup dinners, the best Hungarian doctors paid tribute to him in memorial speeches.

These dinners became important events in the life of Hungarian physicians and the memorial lectures were not merely evidences of admiration for Semmelweis but counted as high-level scientific contributions. While dealing with Semmelweis and his discovery the speeches continued by discussing the most up-to-date problems of medicine [58]. We have already referred to the lecture of Pertik in 1911 but it deserves special mention. Pertik discussed and supported his arguments with scientific evidence to show why the Semmelweis doctrine, based on anatomy and pragmatic medical science, was not able to triumph in his own times [59].

In 1908, a bust of Semmelweis was erected in front of the obstetric clinics of Vienna University. Chrobak and Schauta had referred to the plan in 1906 at the Budapest celebration [60]. The monument is a flat marble obelisk with Semmelweis's profile and name on a bronze tablet. Underneath can be seen the genius of Science, brought into focus by the rays of the rising sun. In 1920 the city council of Vienna named a street after Semmelweis in its district XXI.

The 16th International Medical Conference was held in Budapest between August 29th and September 4th, 1909 and was a great success of Hungarian

medical science. Delegates from foreign countries had an opportunity to see for themselves the development of Hungarian medicine at the end of the past century. By visiting the medical faculties of Hungary and other health institutions they were able to observe the high standard prevailing everywhere. The idea that the medical faculty of Budapest was a mere branch-office of the University of Vienna where the language of instruction happened to be Hungarian could after the conference no longer be entertained in distant countries. It became evident that Hungarian medical science was in a European sense a meaningful factor of medical culture.



The Semmelweis plaque

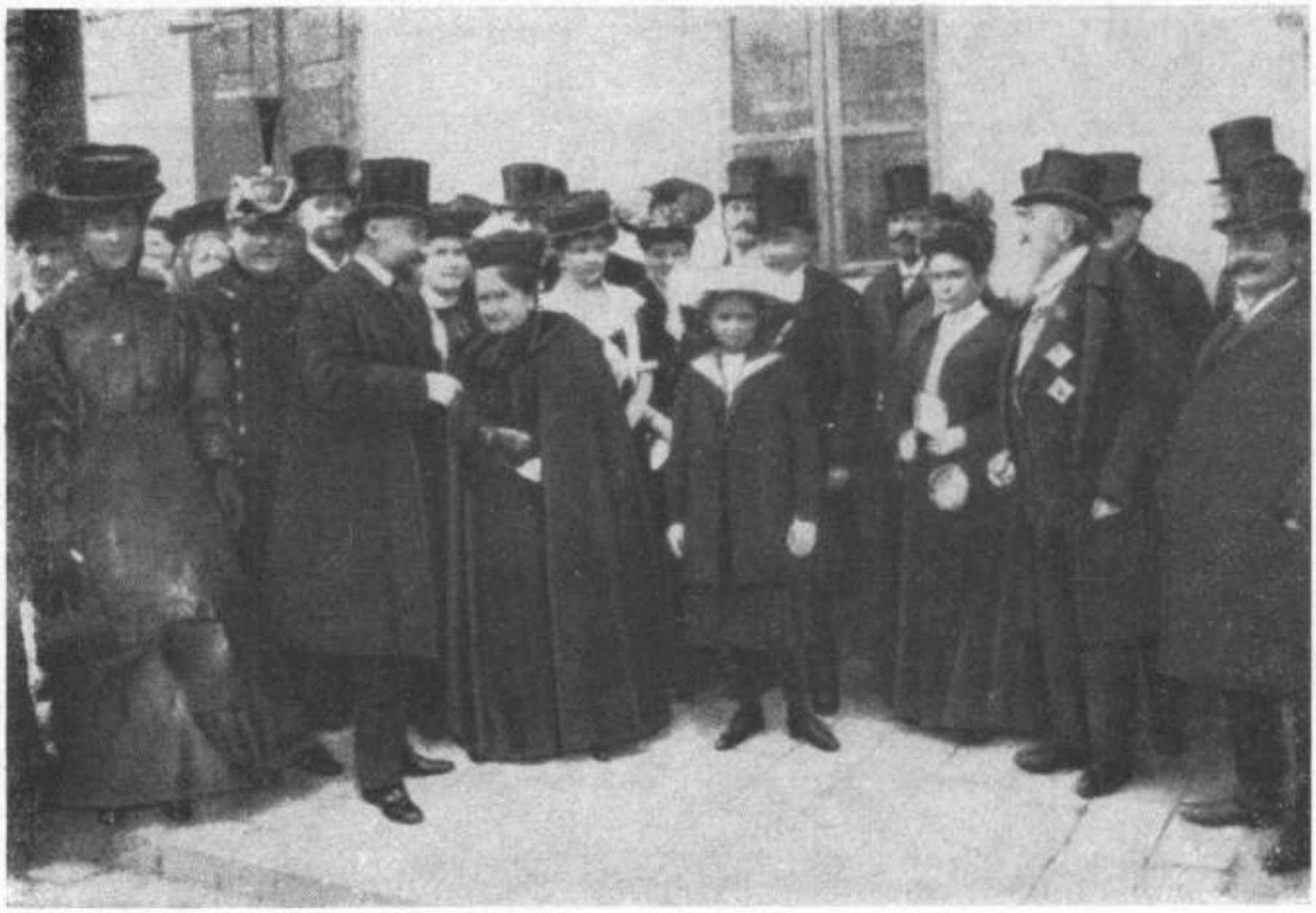
The obstetric and gynaecological section of the Conference discussed the question of puerperal fever under the chairmanship of Tauffer, who in his inaugural address said: ". . . I have much pleasure in welcoming you here, in the spirit of the Semmelweis tradition if I may say so, . . . namely on Semmelweis's pedestal in the history of science, a place has been left vacant for the person whose mind will be illuminated as Semmelweis's was by the divine spark, and who will discover the second, additional, part of the Semmelweis theory, i.e. the cure for puerperal sepsis".

Adolphe Pinard, the doyen of French gynaecologists replied that through clinical observation Semmelweis had pointed to the right procedure for preventing puerperal infection and that the laboratory tests started by Pasteur had supplied the objective means of controlling the disease.

The Conference delegates placed their wreaths at the foot of the Semmelweis statue. Landouzy, dean of the medical faculty of the University of Paris, pronounced the following words at the ceremony: "To Semmelweis whose genius taught the world how to defeat puerperal fever" [62].

The American medical historian, Victor Robinson, standing behind Landouzy at the Budapest ceremony was deeply moved—as he confessed three years later—because looking at the statue he suddenly understood that it was due to Semmelweis that motherhood was at last safely protected [62].

In the same year appeared a new Semmelweis biography from the pen of Sir William Sinclair, Professor of Obstetrics in Manchester, entitled, *Semmelweis. His Life and his Doctrine*, a monograph of the highest scientific standard. The author who had collected material based on documented research, paid warm



The Semmelweis family at the unveiling of the memorial plaque

tribute to Semmelweis's character. In the introduction to his book, Sinclair says that his chief aim was to do justice to the memory of the great Hungarian physician. He has certainly done great service to the cause of Semmelweis, and has settled also the question of priority in his favour [63]. His views on the question have been quoted above.

There were celebrations all over Europe in honour of the centenary of the birth of Semmelweis. Among the memorial addresses, special mention should be made of the one by Vilmos Tauffer in the Medical Society of Budapest and another by I. Fischer delivered before the Medical Society of Vienna.

In his address to the Medical Society of Budapest on October 12th, 1918 Tauffer mainly discussed the question of how Semmelweis's teaching had helped the development of obstetrics and how Lister's teachings, on the other hand, had reacted in the opposite direction. He also dwelt on the question of why Lister's teachings had first taken roots in Germany. Tauffer reviewed the impact of Semmelweis's theory in Hungary, paying at the same time tribute to the merits of Kézmárszky who was the first to apply the doctrine both in theory and practice in obstetrics.

About the same time, the Medical Society had a portrait of Semmelweis painted by the artist Lajos Jámbor. The painting was ceremoniously hung up in the lecture room of the Society.

I. Fischer paid tribute to the memory of Semmelweis in his address to the Medical Society of Vienna on June 11th, 1918. He stressed that the statements

made by Semmelweis and regarded by his contemporaries as presumptuous could only arouse admiration today. He included the controversial declarations expressing Semmelweis's unshakeable belief in the triumph of his doctrine, and his prophetic utterance to Scanzoni that history would never forgive him for being the first to launch an attack against him. Fischer proudly emphasized that the discovery of Semmelweis was made on Austrian soil, and insisted that his statue in Vienna offered ample proof of how proud Austria was of Semmelweis and his work [64].

A Memorial Medal was issued by the Medical Society of Public Hospitals of Budapest in the same year. The Society decided in 1917 to reward the best achievements of its physicians by this revival of the memory of Semmelweis.

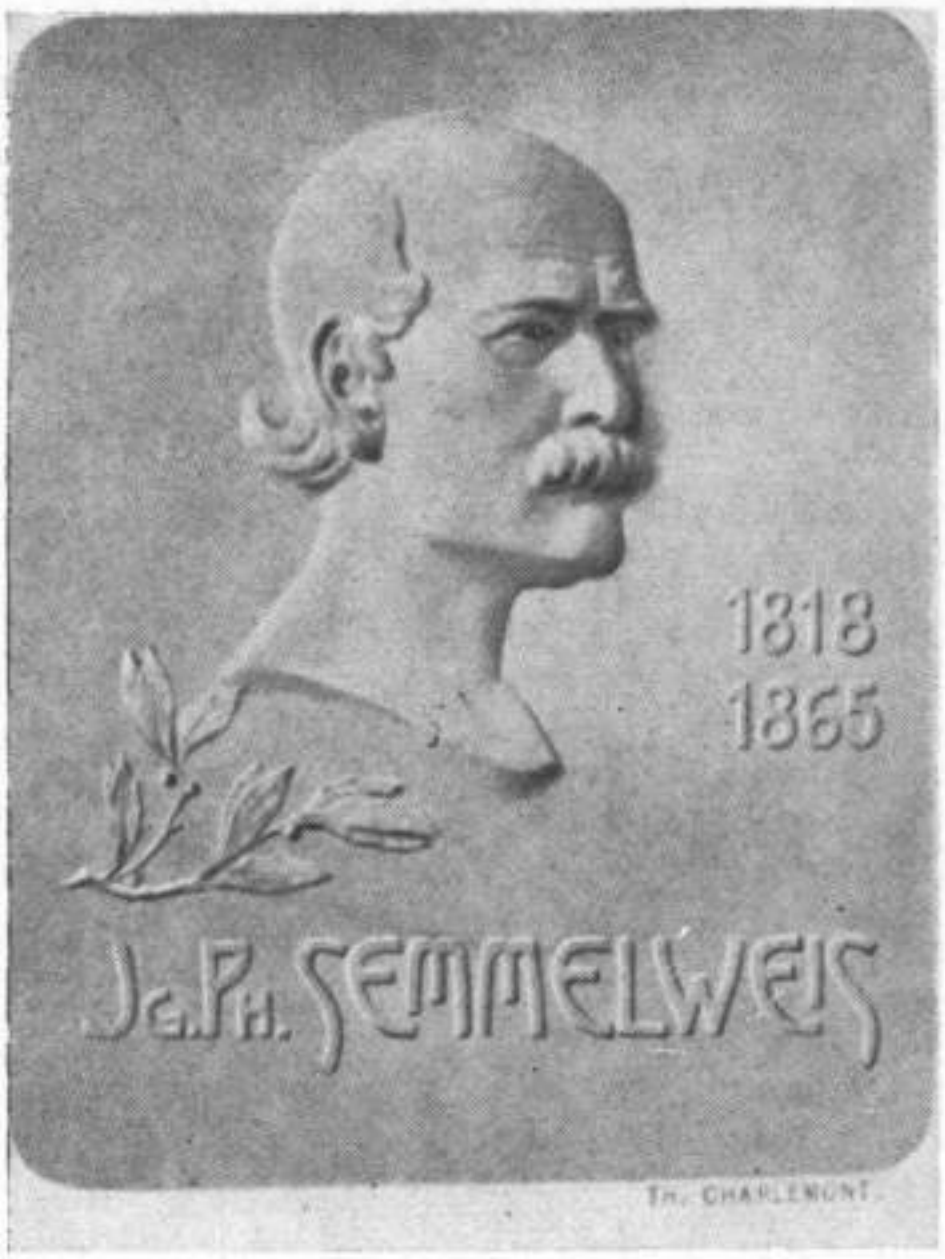
In 1927 celebrations were held in England on the centenary of the birth of Lister. Max Gruber in his festive address to an international audience spoke of the three greatest medical discoveries of the world, that of Jenner, Semmelweis and Lister.



The Semmelweis Cup

At the celebrations held on the centenary of the birth of Tarnier, Adolphe Pinard paid a fresh tribute to Semmelweis. In his address he dealt with Tarnier's dissertation written in 1857 on the disease affecting labouring women and he commented as follows: "Tarnier had stated scientifically with numerical data that the *genius epidemicus* did not penetrate the walls of *Maternité*. But Tarnier was not the first to deny that puerperal fever was a specific contagious disease."

"At the time Tarnier still ignored", continued Pinard, "the ingenious discovery of Semmelweis, although, let us confess it, he had heard of it on January 7th, 1851, at the session of the Academy. We are sorry to say that the scholastic tradition still prevailing in practice then must be considered responsible for the fact that the value of the Semmelweis discovery was not recognized anywhere" [65].



Memorial plaque on the Obstetric Clinic in Vienna

At the 23rd Conference of the Society for History of German Medicine and Natural Sciences held in Budapest in 1929, Karl Sudhoff paid tribute to the memory of Semmelweis on behalf of the Society. "Semmelweis not only discovered", said Sudhoff, "the essence of wound treatment at a crucial stage in a woman's life—in itself an invaluable achievement—but he went even farther in his discoveries. In this festive hour we must repeat this, because however widely Semmelweis has been recognized, the main point has not been brought out with sufficient clarity: namely that Semmelweis clearly saw the danger for both men and women of any kind of wound and wound infection, and that the latter can in all circumstances be prevented. The prevention of childbed fever in all circumstances is only and entirely due to Semmelweis. In general terms, the treatment and prevention inherent in asepsis and antisepsis must also be attributed to him. He not only discovered the essential *nature* but also the *treatment* of the disease, expressing in clear and simple terms the method of prevention . . . We, the German representatives of intensive historical, medical and scientific research, are greatly honoured to be able to place a laurel wreath on the monument of the great Hungarian physician, and in admiration of his genius and achievement we humbly bow our heads before him" [66].

In 1930 the Berlin Medical Society placed the portrait of Semmelweis beside that of Lister in the main building of the Society [67]. In the same year, the University of Szeged (Hungary) unveiled the bust of Semmelweis in its newly established National Pantheon. In 1935, at the tercentenary of the University of Budapest, a bust of Semmelweis was ceremoniously unveiled in the hall of the university to be placed among its most famous professors [68].

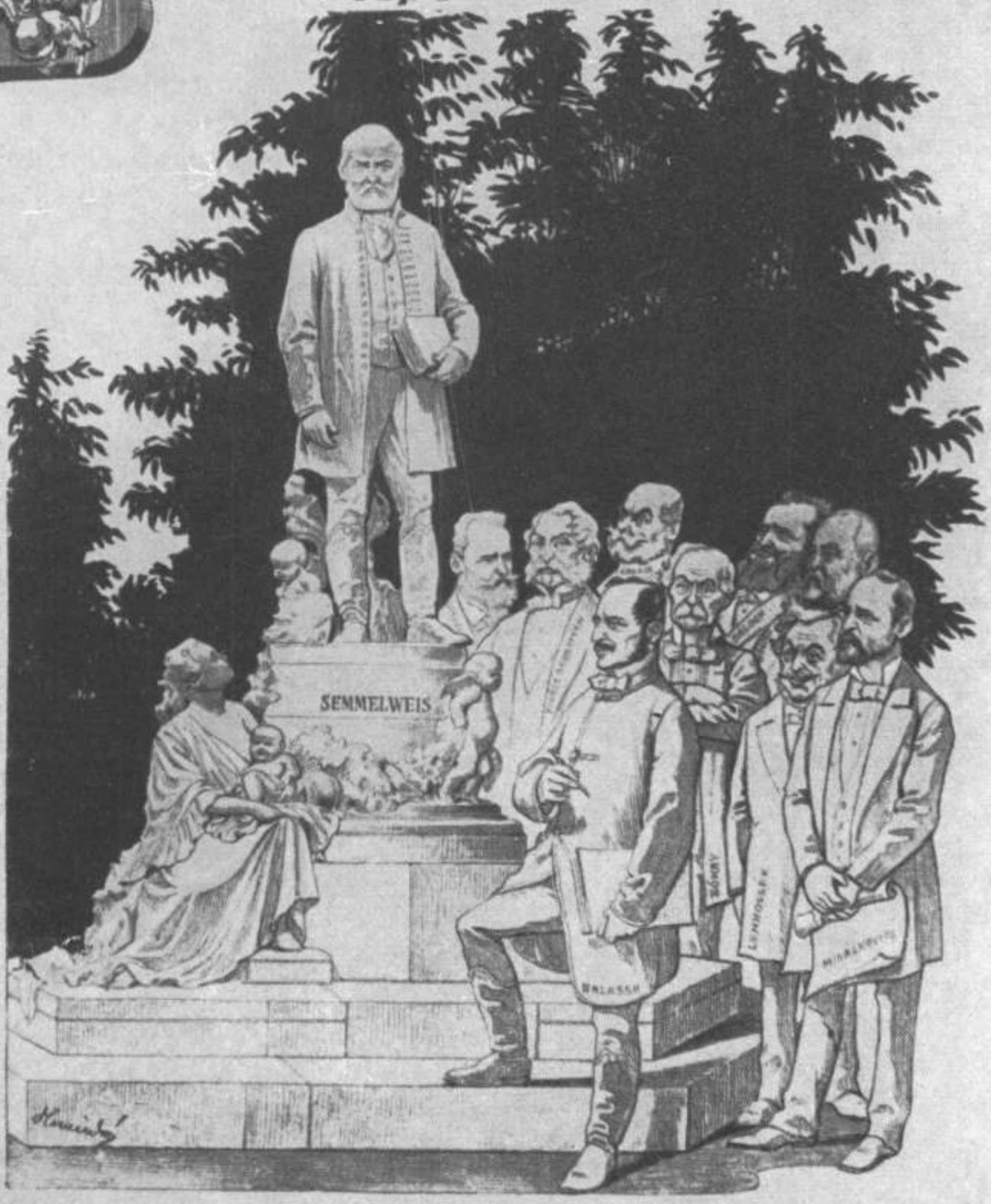
On the centenary of the Semmelweis discovery in 1947 there were festive celebrations all over the world. At the Semmelweis festivities of the University of Budapest, József Frigyesi addressed the meeting. In the Medical Society of Vienna, Leopold Schönbauer [69], in the Academy of Sciences of Lisbon, Professor Sabastio Costa Sacaduro [70], in the Czechoslovak Medical Society of Brno Frantisek Pachner [71], in the Gynaecological Society of Barcelona Juan Vanrell Crules [72], in the Obstetric Society of Brazil, Octavio Souza [73],

Budapest, augusztus 29. 2177. (35.) szám. XLII. évfolyam. 1909.

BORSSZEM JANKÓ

SZERKESZTŐ: CSICSERI BORS.

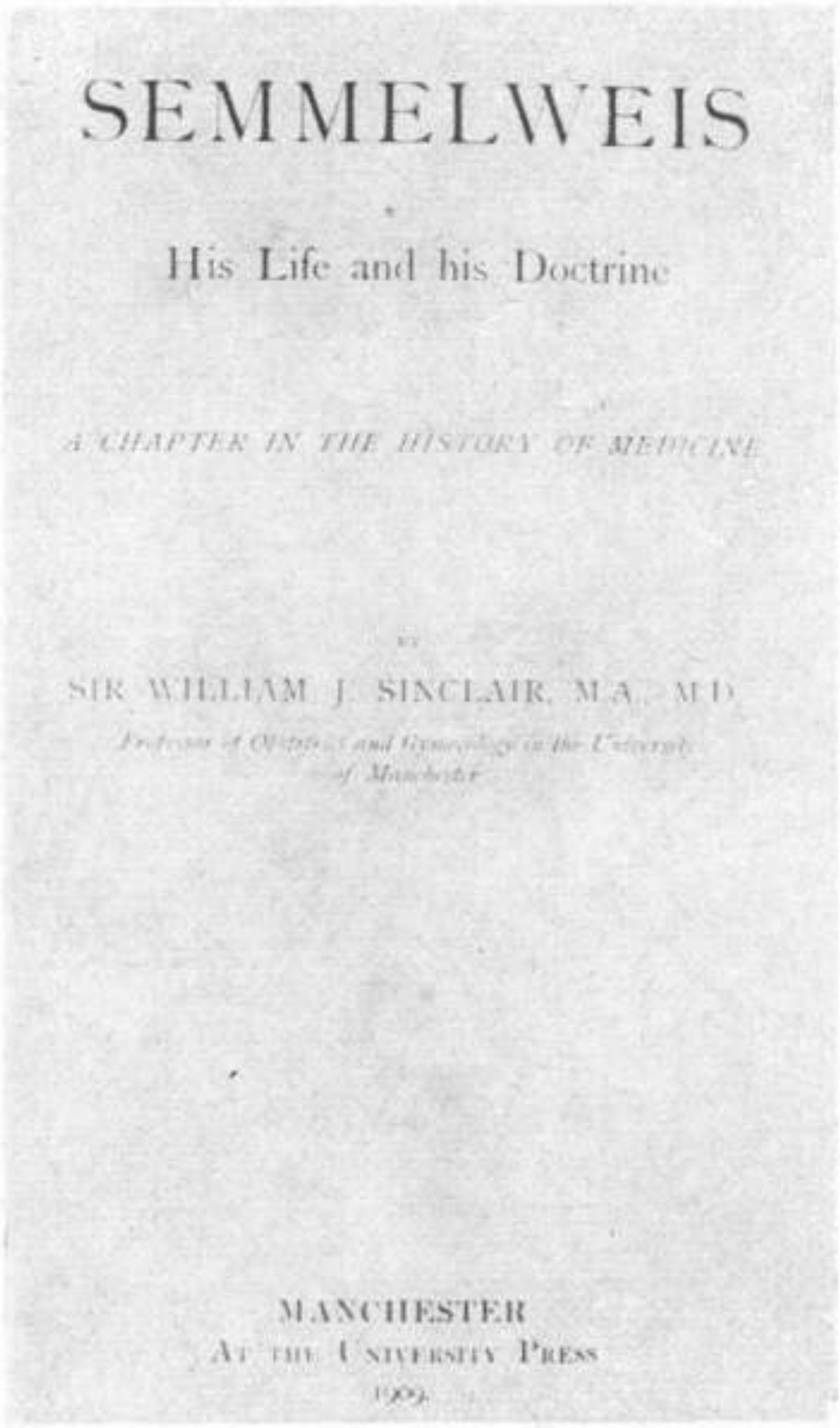
Apotheozis.



„Régi dal, régi dal, régi dicsőségről."

A XVI. nemzetközi orvosi kongresszus tiszteletére. Hommage au XVI^e Congrès International de Médecine.

Picture on the title page of the Hungarian humorous paper *Borsszem Jankó* (No. 35, 1909)


SEMMELWEIS

His Life and his Doctrine

A CHAPTER IN THE HISTORY OF MEDICINE

BY

SIR WILLIAM J. SINCLAIR, M.A., M.D.

Professor of Obstetrics and Gynæcology in the University of Manchester

MANCHESTER
AT THE UNIVERSITY PRESS
1909

Title page of Sinclair's monograph

in the American Society of Obstetricians, Palmer Findley [74] and in the Medical Academy of Mexico, Everardo Lauda [75] made the respective memorial speeches. In the 500-year-old University of Basel, Heinrich Buess, Professor of Medical History paid tribute to the memory of Semmelweis and spoke of his services to medicine [76].

The World Federation of Surgeons in Chicago established a Medical Memorial Museum in 1954 at the suggestion of its secretary general, Max Thorek (1886–1960) of Hungarian descent. Among the ten most outstanding representatives of medicine figures the life-size marbie statue of Semmelweis, the workmanship of the Chicago artist, Edouard Chassing [77].

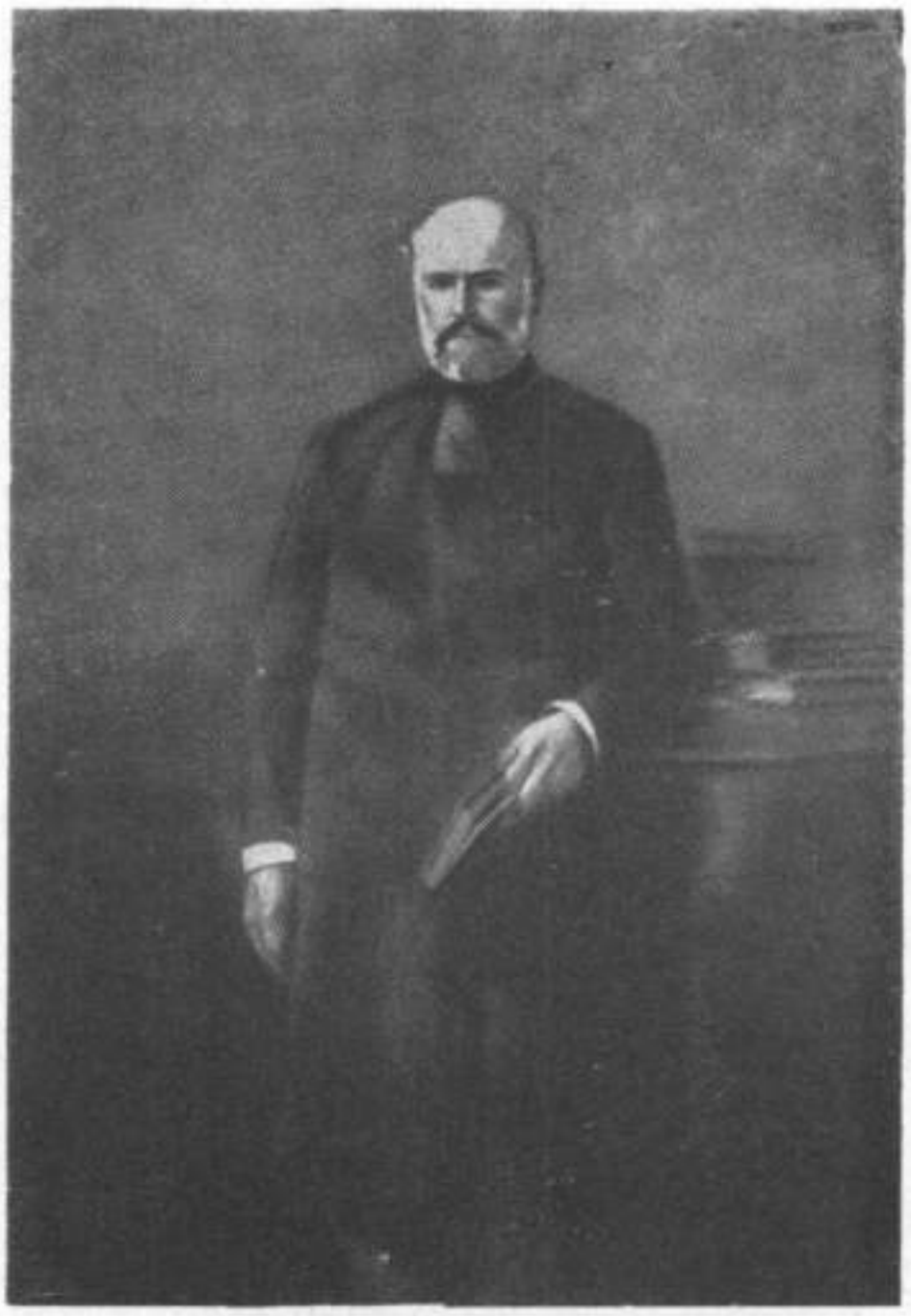
On the eve of the international Semmelweis celebrations of 1906 appeared the collected works of Semmelweis in German, edited by Tibor Győry [98]. Beside the *Aetiology* and other Hungarian and German publications the volume contained articles dealing with the Semmelweis discovery, as well as his Open Letters, the articles of Hebra, Skoda, Routh and Heller and notes made in Vienna on the occasion of Semmelweis's lecture.

Within a short time the complete works also appeared in Hungarian edited by Győry [79], who in the introduction said: "The storms raging over two generations of medicine could not obliterate the teachings of Semmelweis: on the contrary, they rendered fertile the arid ground into which he had sown his idea. The age succeeding him did not change his teachings but only justified them and added further explanations.

"The teachings of Semmelweis are our great treasures. Their merit hinges on two facts: As scientific dogma they are incontestable; as practical theory, they saved the lives of millions. The former was produced by the genius of a cool penetrating brain; the latter, by a feeling heart; he dipped his pen into his heart's blood."

In the series of German medical classics, Zweifel published Semmelweis's *Aetiology* in 1912, as no copy of the 1861 edition was available any longer [80].

In the new edition, the statistical tables and the chapter "Correspondence and Opinions in the Literature for and against my Doctrine" were left out. Zweifel added an introduction and conclusion to this edition which were worthy of the work itself. From these let us pick out a statement typical of the human stature of Semmelweis: How very considerate he was in his writings as regards his former professor, Johann Klein. Zweifel repeatedly stresses that every part of the Semmelweis theory is valid today, if we substitute the word "bacteria" for the expression "decomposed animal organic material". Looking back to the events of the first publication, Zweifel states that in spite of the adverse criticism that the book and the Open Letters received at the time, there were many who sided with Semmelweis, more in fact than he himself believed. It would be wrong, on the other hand, to judge the character of Semmelweis by his controversies, because in his private life he was an affable and pleasant man. With time, he became more irritable and emotional but his intellect was not affected. In his conclusion, Zweifel dwells on the priority claims raised against Semmelweis, and rejects them out of hand.



Portrait of Semmelweis in the Semmelweis Room (painting by Lajos Jámbor)

Semmelweis's classic book appeared in a complete English translation in Baltimore in 1941 [81], made by Frank P. Murphy, Associate Professor of Obstetrics who also wrote an introduction to it. The same author also compiled an annotated Semmelweis bibliography in 1946 [82].

The council of the independent Medical University of Budapest (formerly only a faculty of the university) decided to establish a Semmelweis Memorial Medal in its session of June 10th, 1959. According to the stipulations, the prize can be awarded for any outstanding medical achievement in any branch of medical science. The winner shall subsequently be asked to deliver a memorial lecture. The council shall organize yearly festive Semmelweis sessions where the winner of the prize can report on either his main work, or the results of his general medical research. Beside the main scientific debate, the lecturer shall be called upon to pay tribute to Semmelweis, one of the greatest benefactors of mankind, the paragon of the doctor's profession, and a former professor of the university.



The Semmelweis Memorial Medal

The prize of 10,000 forints and a Semmelweis Memorial Medal are handed over to the winner each year in November by the Rector of the University at the memorial lecture delivered in the course of the festive session arranged yearly [83].

Mention should also be made of the celebrations arranged on the centenary of the death of Semmelweis. To lead up to it, a momentous event took place in 1963: The earthly remains of Semmelweis were exhumed from the Kerepesi cemetery, for the purpose of scientific studies. In 1964 his remains were placed in their final resting place in a stone wall in the yard of the house where he was born, restored for the occasion. 1965 was declared a Semmelweis Memorial Year by UNESCO and celebrations were held both in Vienna and in Budapest. In Budapest they took place under the auspices of the Hungarian Academy of Sciences and scientific lectures were delivered. At ceremonies held on August 13th–14th, 1965 the new memorial of his remains was inaugurated with the erection of a statue "Motherhood" made by the sculptor Miklós Borsos. The restored house where he was born began its new life as the seat of the Semmelweis Medical Museum.

Historic Stature and Significance of Semmelweis

"A new trend arose in the development of the period through the emergence of Ignác Fülöp Semmelweis", stated Dohrn, in his *History of Modern Obstetrics* in 1904 [84]. Semmelweis's discovery however denoted a new trend not only in obstetrics but also in world medicine. He discovered that puerperal fever was

not a specific disease affecting lying-in patients only but that it was one form of pyaemia which can be caused by external infection. We owe to Semmelweis the means of prophylaxis of puerperal fever which was not based on theoretical assumptions but on clinical and pathological observations. Semmelweis did not merely discover the cause of puerperal fever but he also introduced antiseptic prophylaxis into obstetric practice. He laid down the foundations of modern surgery, i.e. of asepsis, the practice of which followed from the discovery of the aetiology of puerperal fever, and was deeply rooted in his ingenious reasoning. The discoverers of bacteriology, Lister, Pasteur and Koch proved by scientific means the correctness of Semmelweis's intuitive findings.



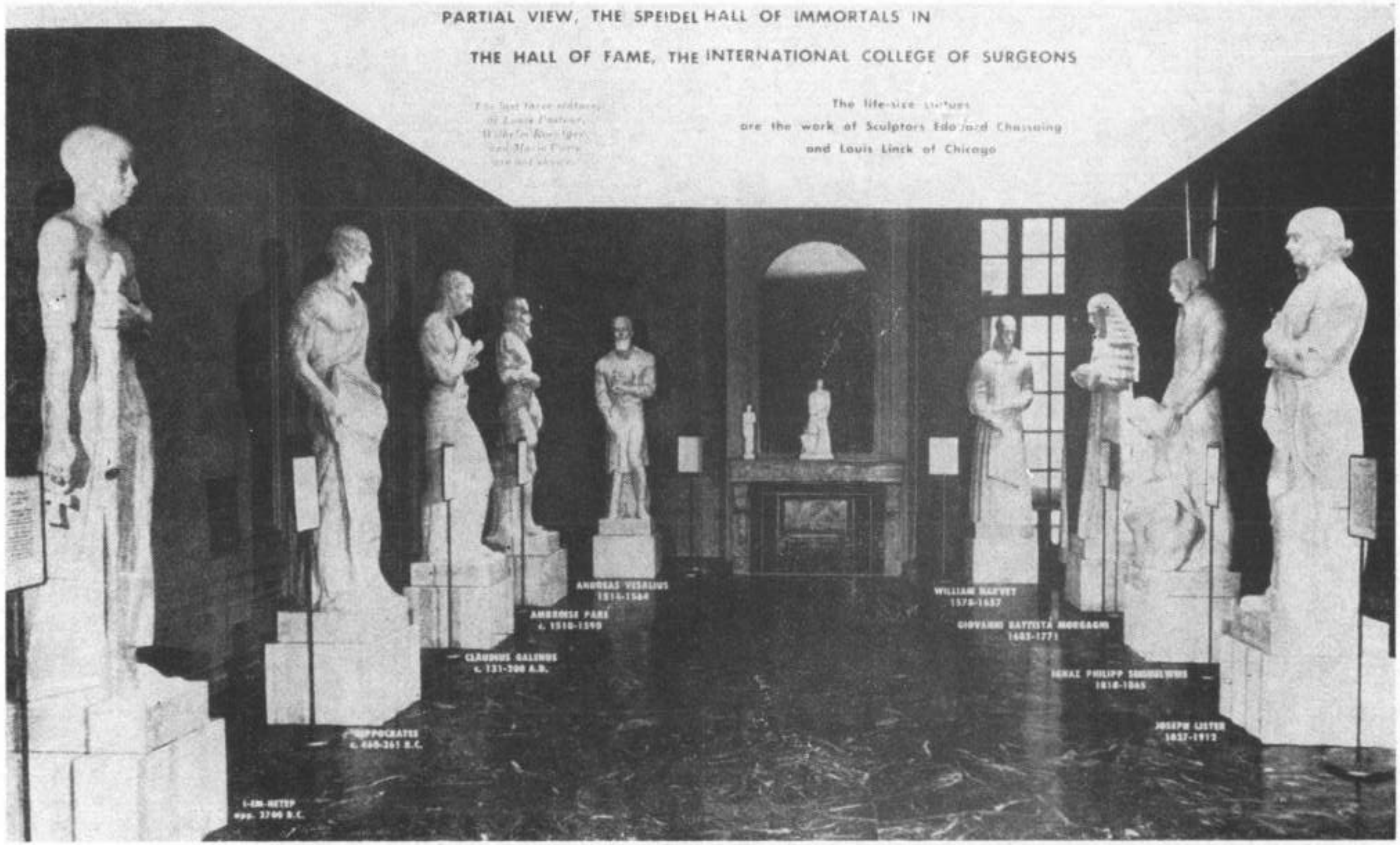
Portrait of Semmelweis in the Medical Society of Berlin (painting by Manfred Pranger, 1930)

According to Tauffer "the Semmelweis doctrine brought a complete change in the history of science, one that seldom occurs, its impact in time and space being immeasurable and immense, its blessings boundless as every woman who becomes a mother can partake of it wherever she may be".

In 1929, Sudhoff in Budapest paid tribute to his memory in these words: ". . . his incomparable deeds bestow immortality on him. As long as the earth will continue to revolve around the sun, he and his work will survive" [85].

The short life and work of Semmelweis opened a revolutionary era in the history of world medicine. However, he was more than a great scientist, he was a great man. When engaged in research to discover the cause of puerperal fever, he had no selfish aims in mind; he was only led by humanitarian feelings and compassion. When, by intuitive reasoning, he came to grasp the essence of puerperal fever he devoted all his energy, every minute of his life to the one thought—to prove his theory and carry it into practice in order to obliterate the dreadful disease. He became the fearless protagonist of his doctrine and he sacrificed his life for his conviction.

His human greatness lies in his unconquerable faith, in his moral earnestness, his will-power to defend his discovery in the defence of a mother's right to live, faced with an inimical world. His strength to fight on was nurtured by his firm character, his humanism, his faith in the idea of progress and, last but not least,

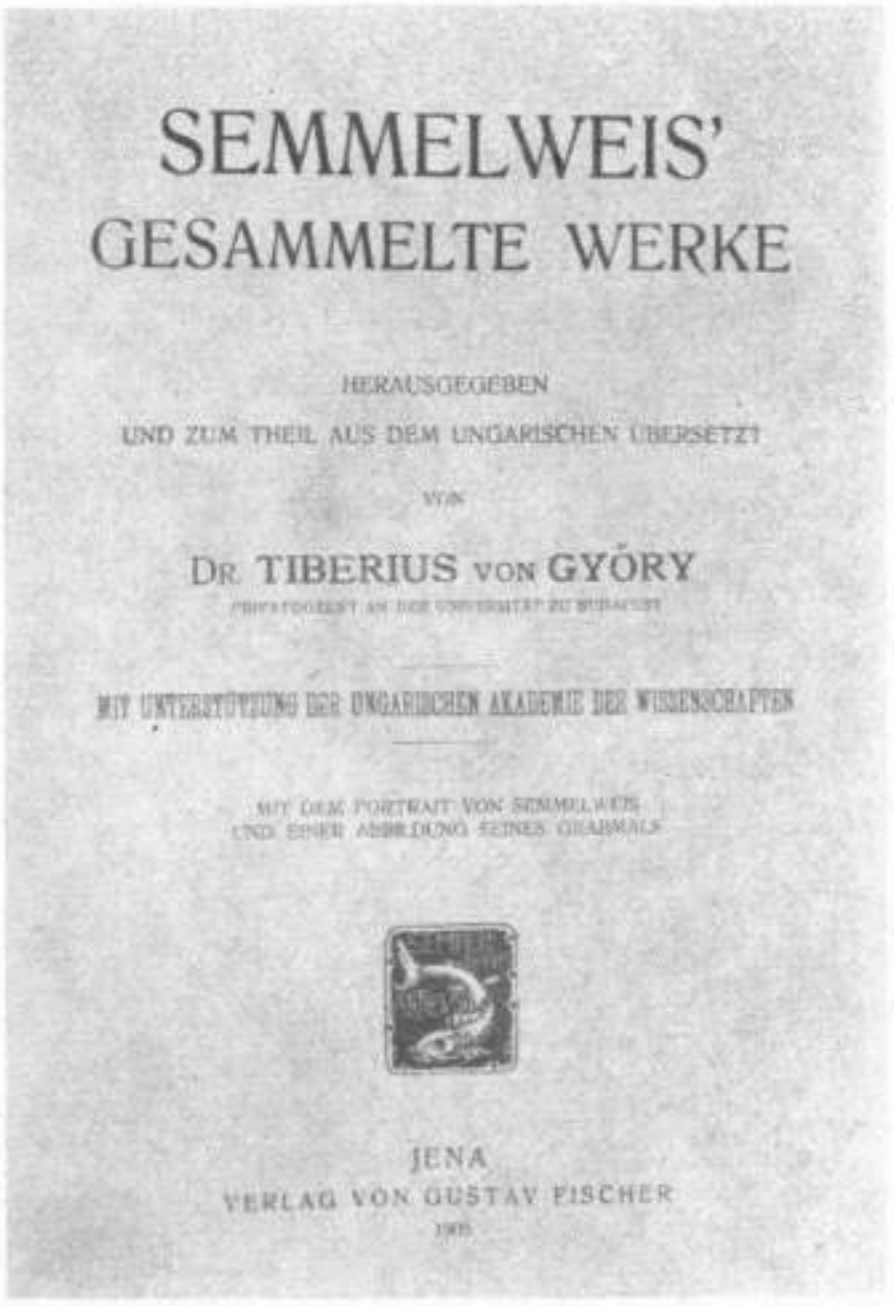


Semmelweis's statue amongst the immortals in the Hall of Fame of the International College of Surgeons, Chicago

by a self-destroying sense of duty. His moral stature assumes vast proportions when we consider his modesty and the selflessness with which he placed his services without consideration of his private interest at the disposal of the whole world.

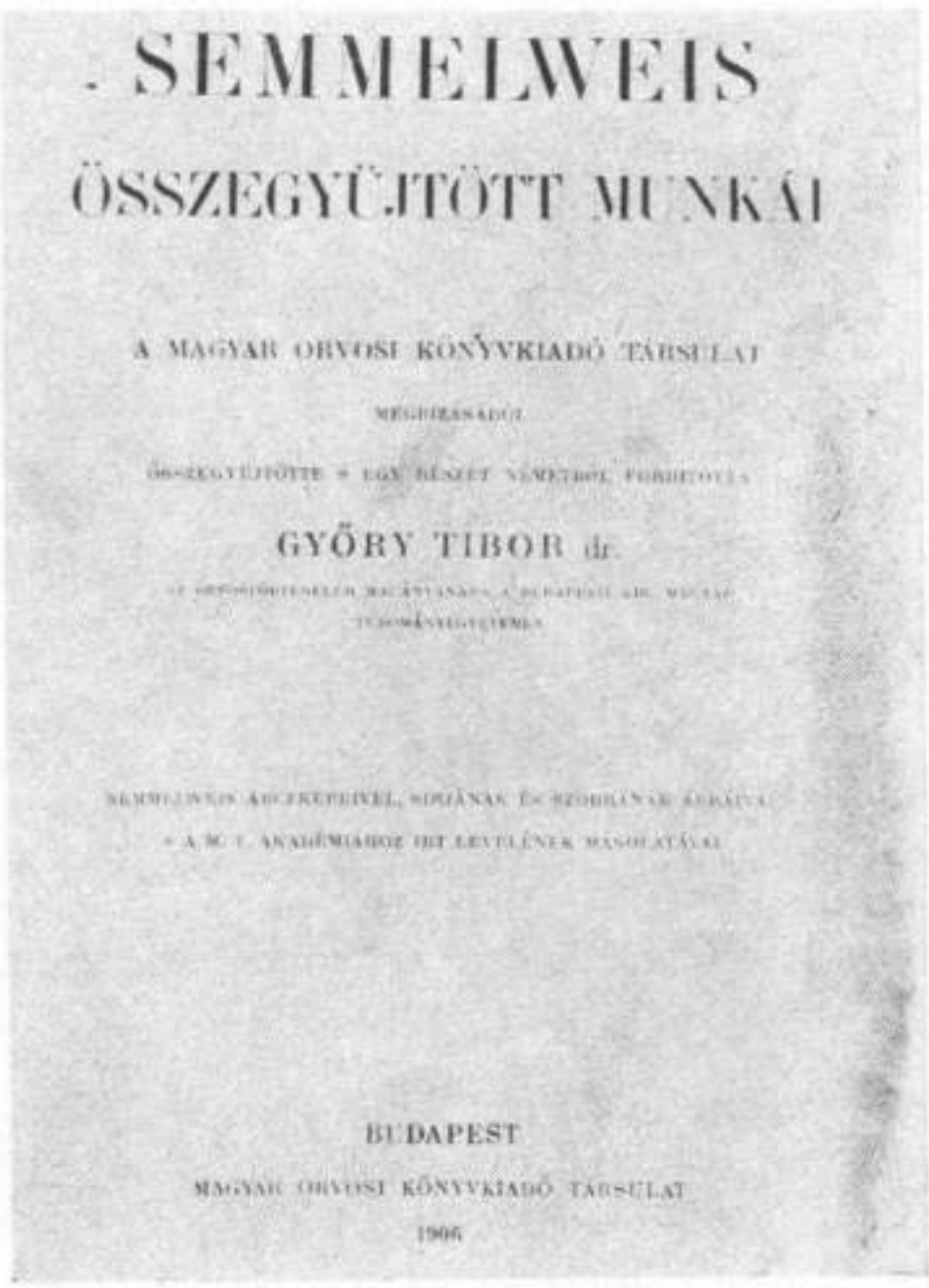
His fight in defence of a scientific truth contains many a moral lesson as regards the real nature and triumph of truth itself, the spiritual independence and freedom of research. His life serves as an example to prove that faith in a scientific truth, prophetic belief and fanaticism in itself is hardly enough. Any new truth will necessarily clash with the interest of the representatives of old-fashioned doctrines, with the principles of a reactionary society. Semmelweis was not unmindful of the social implications of scientific problems and was ready to carry on his fight for his convictions against the forces of social conservatism. He was a revolutionist in science as well as in society.

He is justly called by historians the standard-bearer of science, the pioneer of aetiological and modern bacteriological researches, one of the greatest benefactors of mankind, the John Huss of epidemiology, the Martin Luther of physicians, the most inspired prophet of humane thinking, the embodiment of scientific honesty and of the highest human and medical ideals.

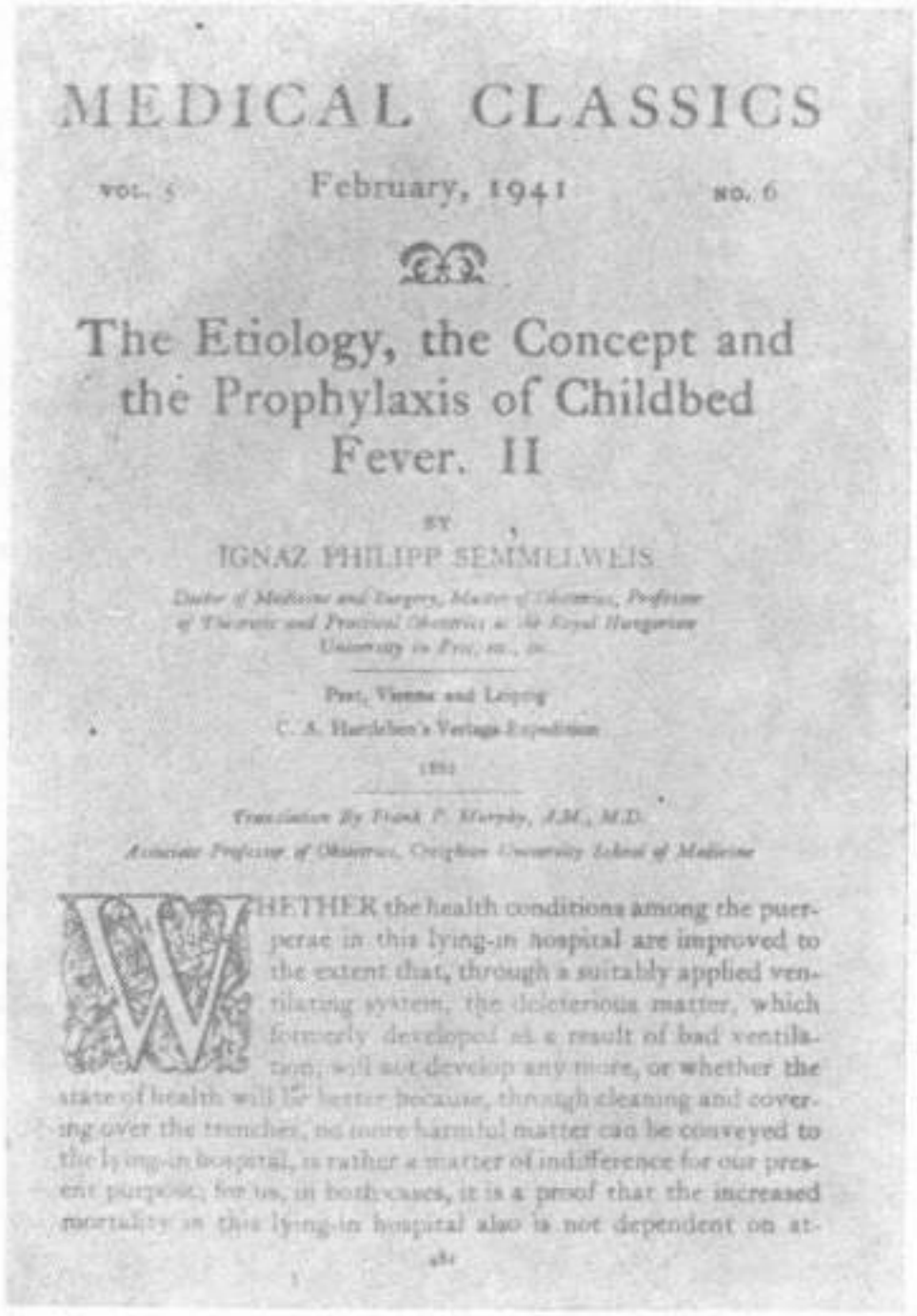

SEMMELWEIS'
GESAMMELTE WERKE

HERAUSGEGEBEN
UND ZUM THEIL AUS DEM UNGARISCHEN ÜBERSETZT
VON
DR. TIBERIUS VON GYÓRY
MIT UNTERSTÜTZUNG DER UNGARISCHEN AKADEMIE DER WISSENSCHAFTEN
JENA
VERLAG VON GUSTAV FISCHER

Title page of Semmelweis's Collected Works in German


SEMMELWEIS
ÖSSZEGYÜJTÖTT MUNKÁI
A MAGYAR ORVOSI KÖNYVKIADÓ TÁRSULAT
GYÓRY TIBOR dr.
BUDAPEST
MAGYAR ORVOSI KÖNYVKIADÓ TÁRSULAT
1906

Hungarian edition of the Collected Works


MEDICAL CLASSICS

VOL. 5 February, 1941 NO. 6

The Etiology, the Concept and the Prophylaxis of Childbed Fever. II

BY

IGNAZ PHILIPP SEMMELWEIS

Doctor of Medicine and Surgery, Master of Obstetrics, Professor of Theoretic and Practical Obstetrics at the Royal Hungarian University in Pest, etc., etc.

Pest, Vienna and Leipzig
C. A. Hartleben's Verlags-Expedition
1861

Translation By Frank P. Murphy, A.M., M.D.
Associate Professor of Obstetrics, Creighton University School of Medicine

WHETHER the health conditions among the puerperae in this lying-in hospital are improved to the extent that, through a suitably applied ventilating system, the deleterious matter, which formerly developed as a result of bad ventilation, will not develop any more, or whether the state of health will be better because, through cleaning and covering over the trenches, no more harmful matter can be conveyed to the lying-in hospital, is rather a matter of indifference for our present purpose; for us, in both cases, it is a proof that the increased mortality in this lying-in hospital also is not dependent on at-

American edition of the *Aetiology*

His full life, so rich in struggles and tortures, so tragic as a human destiny, and the lessons of his career should serve as examples to members of the medical profession. Semmelweis was first and foremost a physician in the loftiest sense of the word, and his heritage is not only surgical cleanliness but moral chastity. He left us a faith unshaken, an optimism which can best be expressed in his own words in the last passage of his book:

"Compared with the vast figures of the past and future, the number of those saved by me or by my students following my doctrine may still be small. Should it not be my fate to see with my own eyes the happy future, the firm belief that this time will come and must come will cheer up my dying days."

Notes

1. K. Mayrhoffer (1837–1882), lecturer at the 1st Obstetric Clinic of Vienna from 1862 to 1870, Untersuchung über Aetiologie des Puerperalfiebers. *Wiener Medizinische Jahrbücher* (1863) p. 28.
2. *Medizinisches Zentralblatt* (1868) p. 27.
3. Friedrich Daniel von Recklinghausen (1833–1910), Professor of Pathological Anatomy in the University of Strasbourg from 1872. He described several diseases called after him (neurofibromatosis, haemochromatosis, ostitis fibrosa cystica). Wilhelm von Waldeyer-Hartz (1826–1921), anatomist and pathologist in Breslau, Strasbourg and, from 1883, in Berlin. He found Streptococci in the internal organs of dead puerperae, in the lymphatics and in the exudate of the peritoneal cavity. Cf. *Archiv für Gynäkologie*, vol. 2 (1871); H. W. Waldeyer and B. Hartz, *Lebenserinnerungen*. (Bonn, 1921); Johannes Orth (1847–1923), Virchow's assistant and later his successor in the University of Berlin.
4. Sur la fièvre puerpérale. *Bulletin de l'Académie de Médecine* (1879) p. 271.
5. Amadée Jacques Doléris (1852–1938), obstetrician in Paris, the first researcher in France in the study of the bacteriology of puerperal fever.
6. Pasteur was elected member of the Hungarian Academy of Sciences in 1881. Endre Hőgyes, in his memorial speech on Pasteur in 1901, did not mention the fact that Pasteur discovered the scientific corroboration of Semmelweis's doctrine in 1879. At the centenary celebration of Pasteur's birth arranged by the Hungarian Academy of Sciences no mention was made by any of the speakers (Albert Berzeviczy, Elek Sigmond, Hugo Preisz, Ferenc Hutyra) of Pasteur's connection with Semmelweis. Cf. *A Pasteur születésének 100. év-*

fordulója alkalmából, 1923. november 26-án tartott ülésen elmondott megnyitó beszéd és előadások (*Opening Address and Speeches at the Pasteur Celebration Held at the Centenary of Pasteur's Birth, November 26th, 1923*). (Budapest, 1927) p. 59. H. Preisz, Megemlékezés Louis Pasteurről (In Memoriam Louis Pasteur). *Természettudományi Közlöny* (*Review of Natural Sciences*) (Suppl. 1923).

7. Th. E. Klebs (1834–1913), German born American anatomist and bacteriologist, assistant to Virchow, later professor at Würzburg, Prague, Zürich (1882) and Chicago (1895) Universities. His researches on the pathology of wound infection had contributed to the solution of this problem. Cf. *Beiträge zur pathologischen Anatomie der Schusswunden.* (Leipzig, 1872).
8. Robert Koch, *Untersuchungen über die Aetiologie der Wundinfectionskrankheiten* (Leipzig, 1878) p. 80. In the introduction to his work he writes: "*In neuerer Zeit ist man immer mehr zu der Überzeugung gekommen, dass auch das Puerperalfieber als eine von der Placentarwundstelle oder Verletzungen der Geburtswege ausgehende infectiöse Wundkrankheit anzusehen ist.*"
9. B. Krönig and B. C. Menge: *Bakteriologie des weiblichen Genitalkanals der schwangeren, kreissenden und puerperalen Frau* (Leipzig, 1897).
10. "*Setzt man statt thierisch-organischen Stoff Spaltzpilze mit den nötigen Folgerungen, so trifft die Erklärung des Begriffes 'Kindbettfieber' wie sie der grosse Wohltäter der Frauenwelt gegeben hat, auch heute noch das wesentliche und kann durch eine bessere nicht ersetzt werden.*" Cf. O. Herff, Das Kindbettfieber. Vol. II. In K. W. Winckel, *Handbuch der Geburtshilfe.* (Wiesbaden, 1906).
11. Hugo Schottmüller (1867–1937), German physician and bacteriologist, Zur Bedeutung einiger Anaerobier in der Pathologie insbesonders bei puerperalen Erkrankungen. *Mitt. Grenzgeb. Med. u. Chir.* (1910). Ernst Bumm (1858–1925), Scanzoni's assistant, later Professor of Obstetrics in Würzburg (1885), Basel (1894), Halle (1901) Universities, the Charité (1904) and Berlin University (1910–1924). He was an outstanding expert of puerperal bacteriology. R. Schubert, Über das Vorkommen der Fränkel'schen Gasbazillen in der Vagina der gesunden Frauen. *Zbl. für Bakteriologie und Hygiene* (1928) p. 331. Chronological discussion of puerperal bacteriological results by James Eisenberg, Zusammenfassender historischer Bericht vom bakteriologischen Standpunkt aus. *Zbl. für Bakteriologie und Parasitenkunde* (*Jena*) (1883), pp. 336–340, 372–375; Winter, Die Mikroorganismen im Genitalkanal der gesunden Frau. *Zschr. für Geb. u. Gyn.* (1888).
12. Semmelweis. *Az Ujság* (*The News*), September 30th, 1906; Memorial Speech by Tauffer. Budapest (1918) p. 29.
13. His successors until Kézmárszky had not followed his teachings, neither in Rochus Hospital, nor at the Obstetric Clinic of the University of Pest. His discovery had, more or less, been forgotten in Hungary. There is no mention of strict antiseptic cleanliness, nor of obstetric prophylaxis in József Fleischer's handbook of midwifery, in general use until 1874, *Alsóbb szülészet tankönyve bábák számára* (*Obstetric Primer for Midwives*) (Buda, 1869). The *Pallas Encyclopaedia* in its short paragraph on Semmelweis (1897) makes no mention of his chief work (vol. XIV, p. 1050). Gusztáv Dirner (ed.), *A nemzetközi Semmelweis-emlék Budapesten* (*International Semmelweis Memorial Volume*). (Budapest, 1909). Kálmán Müller, *Az orvosi tudomány nagy mesterei* (*The Great Masters of Medical Science*) (Budapest, 1924).
14. J. Fleischer, Emlékbeszéd Semmelweis Ignác tanár felett (In Memoriam Professor Ignác Semmelweis). Delivered at the Royal Medical Society of Budapest, November 2nd, 1872. Cf. *OH* (1872) pp. 775–786.
15. Kézmárszky speaks in his book of Fleischer's services to the Semmelweis cult: "I have much pleasure in paying tribute to the memory of József Fleischer who died in the prime of his life, the former assistant of Semmelweis, the scholar, practically the only follower for years of the teachings of Semmelweis."

16. János Ambró (1827–1889) in his obstetric textbook: *Szülészeti tankönyv szülésznők számára* (*Obstetric Textbook for Midwives*) (Pozsony, 1874), propagated the principle of asepsis by recommending the chlorine wash for disinfecting the hands. His book begins with the biography of Semmelweis. In 1873 Ambró published a popular textbook of midwifery in the Slovak language, dedicated to Semmelweis: *Kniha o porodnictve pre baby* (Skalici, 1873). Cf. Tivadar Kézmárszky. Ambró János (In Memoriam János Ambró). *OH* (1890) p. 251; János Ambró, A szülőházak és Semmelweis tanár tanai (The Lying-in Hospitals and the Teachings of Prof. Semmelweis). *OH* (1870) p. 14; idem, *Irányeszmék a magyar állam területén felállítandó bábaintézetek szervezésénél* (*Directives for the Organization of New Training Colleges for Midwives in Hungary*) (Pest, 1871); *Gyógyászat* (*Medical Practice*) (1871) p. 780.
17. In Memoriam Semmelweis, on the Centenary of his Birth. Delivered at the festive session of the Royal Medical Society of Budapest by Vilmos Tauffer, on October 12th, 1918. Cf. *OH* (1918), p. 30.
18 A szülészet ügyének (bába ügy) állása hazánkban, mint a gyermekek és gyermekágyasok nagy halálozásának egyik tényezője. Javaslatok a szülészeti intézmény fokozatos fejlesztésére (The obstetric situation in Hungary, the high mortality rate of infants and childbed patients. Proposals for development of obstetric institutions). With permission of the Puerperal Committee of Royal Medical Society of Budapest and collaboration of Dr. Imre Berczeller, former university assistant. Written by Prof. Vilmos Tauffer, Budapest, 1891, XXIX-165. The Puerperal Committee collected data to assess the obstetric situation from 12 380 villages. Data were furnished by local general practitioners.
19. J. Bruck, *Ignác Fülöp Semmelweis.* (Budapest, 1895); *Ignacz Philipp Semmelweis. Eine geschichtlichmedizinische Studie.* (Wien, 1887).
20. *Monatsschrift für Geburtskunde und Frauenkrankheiten* (1865) pp. 127–155, 161–205.
21. "*Semmelweis . . . erweiterte seine Anschauung schliesslich zu der Lehre, dass das Kindbettfieber ein Resorptionsfieber sei, hervorgerufen durch Infection mit zersetzten thierischen Stoffen. Diese Deutung ist in den letzten Jahren in immer grössere Kreise eingedrungen, und wird in kurzer Zeit kaum noch Gegner finden.*" Cf. A. C. G. Veit, Krankheiten der weiblichen Geschlechtsorgane. Puerperalkrankheiten. In: *Handbuch der speziellen Pathologie und Therapie.* Ed. by Rudolf Virchow. Vol. VI. Second revised and enlarged edition (1867).
22. Franz Ludwig Karl Wilhelm Winckel (1837–1911), Professor of Obstetrics in the Universities of Rostock, later Munich (1883–1907). He was among the first to recognize the teachings of Semmelweis.
23. "*Was ist Puerperalfieber? . . . Sieger in den Discussionen der letzten beiden Jahrzehnten ist die Lehre vom infectiösen Character des Puerperalfiebers geblieben.*" Cf. Über das Wesen des Puerperalfiebers. Sammlung klinischer Vorträge. Ed. by Richard Volkmann. *Gynäkologie* (1870) pp. 1–24. Otto Spiegelberg (1830–1881), Professor of Obstetrics in the Universities of Freiburg, Königsberg and Breslau, Corresponding Member of Medical Society of Budapest (1874). Gyula Elischer spoke in memoriam Spiegelberg on January 13th, 1883.
24. "*. . . begründet wurde diese Ansicht durch Semmelweis, der überall da, wo von den Wohltätern des Menschengeschlechtes die Rede ist, in erster Reihe genannt zu werden verdient. Er trat zuerst im Jahre 1847 mit der, wie sich leicht zeigen liess, durchaus einseitigen und ungenügenden Behauptung auf, auf der die Infection mit Leichengift beruhe, erweiterte aber seine Ansicht selbstständig so weit, dass man die jetzt herrschende Anschauung von der Aetiologie im wesentlichen als sein Eigentum und sein Verdienst betrachten muss.*" Cf. K. Schroeder *Lehrbuch der Geburtshilfe mit Einschluss der Pathologie der Schwangerschaft und des Wochenbettes.* (Bonn, 1871) p. 588.
25. A gyermekágyi láz prophylaxisának kérdéséhez (To the Question of the Prophylaxis of Puerperal Fever). *OH* (1883) pp. 106–137.
26. A. Hegar, *Ignaz Philipp Semmelweis. Sein Leben und seine Lehre. Zugleich ein Beitrag zur Lehre der fieberhaften Wundkrankheiten* (Freiburg–Tübingen, 1882) p. 52.

7. "*Ehre dem genialen Kopf welcher unbeirrt durch die herrschenden Anschauungen und Systheme eine so bedeutungsvolle heilbringende Wahrheit erkannt hat. Ehre dem Manne, mit dem edlen Gemüt, bei welchem das Mitgefühl mit der leidenden Menschheit als mächtige Triebfeder zur Auffindung und zur Weiterverbreitung jener Wahrheit mitgewirkt hat.*" In Hegar's letter addressed to the Semmelweis Memorial Committee in 1906 he says that it was he who in 1882 "revived the memory of the man of exceptional genius who had been long forgotten". Gusztáv Dirner (ed.), *A nemzetközi Semmelweis-emlék Budapesten* (*International Semmelweis Memorial Volume*). (Budapest, 1909) p. 292.
28. The notes prepared by Hirschler for Hegar (*Aufzeichnungen*) contain false particulars concerning Semmelweis's family tree. According to Hirschler the parents or grandparents of Semmelweis were settlers from Austria. Cf. also Lajos Varga, *Adatok Hirschler Ignác életrajzához* (*Facts and Dates to Ignaz Hirschler's Biography*). Publications of the Hung. Library for Medical History (Budapest, 1959) pp. 15–26, 248–273.
29. Hegar's Wirken im Geiste Semmelweis. Ein Beitrag zur Zeitgeschichte. *Monatschrift für Geburtshilfe und Gynäkologie* (1930) pp. 8–21. As a medical student Vilmos Tauffer had been directly involved in the Semmelweis question. Mór Benedikt (1835–1920), a Viennese neurologist of Hungarian descent, had made skull-observations in Liptóvár prison of which Tauffer's brother was governor. Young Tauffer assisted him in his examinations. Benedikt, who was known to be on bad terms with most of his colleagues in Vienna, is believed to have made satirical remarks on some Viennese authorities who did not approve of Semmelweis.
30. H. Fritsch (1844–1915), obstetrician in Breslau, *Pathologie und Therapie des Wochenbettes* (Stuttgart, 1884) p. 200.
31. *Münchener Med. Wschr.* (1893) pp. 871–874.
32. Max Sänger (1853–1903), Professor of Obstetrics in Prague University from 1899. Albert Siegmund Gustav Döderlein (1860–1914), Professor of Obstetrics in Münich, engaged in gynaecological bacteriology. Gustav Veit (1824–1903), Professor of Obstetrics in Bonn from 1864 to 1893.
33. P. Zweifel, *Die 50-jährige Gedenkfeier der Semmelweisschen Entdeckung*. (Leipzig, 1907) p. 30.
34. "Nearly all the English medical men were in sympathy with Semmelweis and afforded him the honour he deserved." Cf. Th. Cianfrani, *A Short History of Obstetrics and Gynaecology*. (Springfield, Ill., 1961) p. 310.
35. *British Med. J.* (1875) pp. 267–270, 304–306, 337–339, 371–373, 408–409, 440–442.
36. "*Ich habe Obiges hervorgehoben um zu zeigen, in welchem Wirrsal sich die Lehre von der febris puerperalis noch jetzt, jenseits des Kanals befindet. Vielfach hat man nämlich behauptet in England sei das, was Semmelweis gelehrt hat, schon längst bekannt gewesen. Nun ich glaube, wer die Verhandlungen der Obstetrical Society und auch das, was früher über das Verhältnis der spezifisch infektiösen Krankheiten zur febris puerperalis und die Kontagiosität letztere Affection in England produziert worden ist, kennt, wird die einfache und klare Doktrine von Semmelweis nicht mit diesen zerfahrenen Anschauungen verwechseln.*" Hegar, op. cit. pp. 42–49.
37. O. Pertik, In Memoriam Semmelweis. *OH* (1888) pp. 209–210.
38. *De l'asepsie et l'antisepsie en obstétrique*. (Paris, 1894) p. 380.
39. Tarnier's memorial was unveiled in Boulevard Montparnasse, in front of Clinique Tarnier on July 1st, 1905. In his memorial speech Paul Camille Hyppolyte Brouardel (1838–1906) called Tarnier the first discoverer of the aetiology and prophylaxis of puerperal fever. Cf. *OH* (1905) p. 473.
40. "*Semmelweis a indiqué du premier coup les moyens prophylactiques que l'on doit prendre contre l'infection puerpérale, avec une telle précision que l'antisepsis moderne n'a rien eu à ajouter aux règles qu'il avait prescrites.*" Cf. G. F. J. Widal, *Etudes sur l'infection puerpérale. La phlegmasia alba dolens et l'erysipèle.* (Paris, 1889) p. 168.
41. "*Ah! Certes mon admiration pour Pasteur est sans bornes, j'ai une infinie reconnaisance pour Lister, les noms de Doléries, Chauveau et Arloing ne devront jamais être oubliés, les*

travaux de Fernand Widal, en faisant connaître le plus commun de nos ennemis, firent époque, mais il faut reconnaître que Semmelweis avait, par sa découverte le premier déchiré le voile qui obscurcissait tout avant lui, et mis entre les mains des médecins les moyens prophylactiques qui sont, en somme et en réalité, ceux employés par nous tous aujourd'hui." Cf. A. Pinard, Extrait des *Annales de Gynécologie et d'Obstétrique*, November 1906.

42. A. Nast, Semmelweis: Le fou de Buda. *Presse Médicale* (1951) p. 1139.
43. Tivadar Kézmárszky, Semmelweis. *OH* (1891) p. 210.
44. Semmelweis Festreden bei Gelegenheit des VIII. internationalen Kongresses für Hygiene und Demographie zu Budapest, *Comptes-Rendus et Mémoires.* Vol. I, p. 246. In *Természettudományi Közlöny* (*Review of Natural Sciences*) (1894) pp. 303, 561. Hueppe's address was not received with unalloyed approval by the Hungarian public, because the lecturer presented Semmelweis as an Austrian. Hueppe was gravely criticized by Robert Töply, anatomist and medical historian in Vienna, because of the former's attack on Viennese doctors (Braun, Späth, Breiszky, etc.), and his failing to submit historical evidence. *Janus* (*Amsterdam*) (1896–1898) p. 300.
45. A. Chantemesse (1852–1919), French serologist, Professor of Experimental Pathology at the University of Paris.
46. V. Manninger (1876–1945), the future great Hungarian scholar and surgeon, who won the prize with: *Az antisepticus és asepticus orvoslás története* (*The History of Antiseptic and Aseptic Treatment*) (Budapest, 1903) p. 155. Imre Berczeller (1861–1936), gynaecologist in Budapest, his *A szülészeti és sebészeti antisepsis története* (*History of Obstetric and Surgical Antisepsis*) was also rewarded.
47. F. Schürer von Waldheim, *Ignaz Philipp Semmelweis. Sein Leben und Wirken. Urteile der Mit- und Nachwelt.* (Wien, Leipzig, 1905) p. 256.
48. "*Wie hat Wien, wie Österreich für all den Segen gedankt? Mir Vergessen . . . Die Verdienste Edward Jenners ehrte das englische Volk durch ein Nationalgeschenk von 30,000 Pfund Sterling, und im Jahre 1857 (34 Jahre nach seinem Tode) durch Errichtung seiner Statue auf Trafalgar Square in London — für Semmelweis' Andenken hat man in Österreich bisher keinen Finger gerührt, keinen Heller verausgabt. Da gibt es also, eine grosse Schuld zu tilgen.*" Op. cit. p. 248.
49. Gusztáv Dirner (ed.), *A nemzetközi Semmelweis-emlék Budapesten* (*International Semmelweis Memorial Volume*). (Budapest, 1909).
50. "*Wenn ich von mir selbst noch reden darf, so ist es, dass ich des jetzt schon seltenen Vorzugs mich freue, Semmelweis persönlich bekannt zu haben. Als ich zu Anfang der sechziger Jahre in Wien war, fuhr ich herüber nach Budapest, um den Mann, dessen Verdienste mir imponierten, meine Hochachtung auszusprechen.*"
51. Rudolf Chrobak (1840–1910), Professor of Obstetrics at the 2nd Obstetric Clinic in Vienna.
52. "*Es ist wohl kein Zufall, dass gerade die Wiener Klinik es war, aus welcher die Forschungen Semmelweis' hervorgegangen sind. Zu der Zeit, als Semmelweis wirkte, gab es noch keine Bakteriologie und der Begründung seiner Lehre konnte wohl auf eine andere Weise nicht erbracht werden, als auf dem Wege der Statistik. Soll eine Statistik aber beweisend sein, so muss sie mit grossen Zahlen rechnen. Welche Klinik der Welt wäre im Stande gewesen, Semmelweis solche Zahlen zu liefern wie die Wiener Klinik? Zu der Zeit, als der Held der heutigen Feier mit seinen epochalen Entdeckungen hervortrat, konnte die Klinik bereits auf eine 63 Jahre lange Vergangenheit zurückblicken mit einer Geburtenzahl von 186,000 und darüber. Aber es bedürfte des Feuergeistes von Semmelweis, um in alle diese toten Zahlen Leben zu bringen . . . Heute zweifelt wohl niemand mehr an der Richtigkeit der Semmelweisschen Anschauungen . . . und die Resultate, welche wir heute an den Kliniken erzielen und die konsequente Fortbildung und Anwendung der Semmelweis'schen Grundsätze sind so glänzend geworden, dass uns sie die kühnsten Erwartungen Semmelweis' weit übertreffen . . . Wir Wiener sind uns seit langem dessen bewusst, dass bis jetzt noch nicht getan haben, so ist es nicht vielleicht deshalb gewesen, als ob wir darauf vergessen hätten.*"

53. Johannes Andreas Fiebiger (1867–1928), Danish anatomist-pathologist. Nobel-prize winner for his services in experimental cancer research.
54. Ernesto Pestalozza (1860—1934), Professor of Gynaecology, University of Rome. "*Dovuto al Semmelweis nelle Università italiane in quelle di tutto il mondo civile e il nome di Semmelweis che si inizia lo studio dei mervigliosi portati dell' Antisepsi. Oggidi la venerazione universale ha concelato l'immeritata trascuranza dei contemporanei, che fu il tormento della sua vita apostolo fervente, e la causa perturbatrice del suo spirito geniale; oggi da tutte le parti del mondo, da tutti i centri di studio il pensiero volge all' Ungheria ed e percio anch'io mi onoro di portare da Roma alla nobile Universitá di Budapest, ed i monumento die Semmelweis l'ommaggio delle Universitá italiane di Roma, Firenze, Milano, Pavia, Pisa, Parma . . .*"
55. "*Die Schweiz hat Semmelweis gegenüber eine besondere Pflicht zu erfüllen. Fassten doch zuerst in diesem Lande seine Lehren festen Fuss. Prof. Bischoff in der Schweiz wurde ein begeisterter Anhänger Semmelweis', und er suchte dessen Lehren, soweit seine kärglichen Mittel reichten, zu verwirklichen. Seither ist bei uns die Bekämpfung des Kindbettfiebers systematisch in Angriff genommen worden. Die damaligen zarten Pflänzlein, die gegen diese Krankheit da und dort gepflanzt wurden, wuchsen zu schönen Bäumen heran, die allerorts, in allen Landen segensreiche Früchte tragen. Basel insbesonders blieb treu den Traditionen Semmelweis' und suchte dessen Lehren in jeder Weise durchzuführen und so kann heute bei uns jede Gebärenanstalt als Muster dafür dienen, wie in der Bekämpfung der Puerperalinfection Behörden, Aerzte und Hebammen Hand und Hand einhergehen.*"
56. According to István Tóth, the woman's figure on the statue was modelled after the artist's wife. Cf. *OH* (1927) pp. 131–132.
57. Rezső Temesváry (1864–1944), gynaecologist in Budapest, chief librarian of the Medical Society, editor of *Gynaecology*, supplement of *Medical Weekly*, member of the Semmelweis Memorial Committee.
58. *Semmelweis emlékbeszédek 1907–1941* (*Semmelweis Memorial Lectures, 1907–1941*). Edited and introduced by I. Domány, secretary of the Medical Society (Budapest, 1947).
59. Ottó Pertik (1852–1913), pathologist. Cf. *In Memoriam Semmelweis*. Memorial lecture before the Medical Society on January 24th, 1911 (Budapest, 1911).
60. Weckerling, physician in Hessen, who was present at the inauguration of the Semmelweis memorial in Budapest in 1906, when Vienna declared her intention of raising a memorial to Semmelweis in 1907, wrote an article, "Zur Errichtung eines Semmelweisdenkmales in Wien" where he expressed the opinion that it would have been more to the point to represent Semmelweis in the Budapest statue as a fighter, with raised fist, shouting to the German professors: "You must stop murdering!" Cf. *Aerztliche Reform Zeitung* (1907) p. 96. Cf. Heinrich Kahr, Auf Semmelweis Spuren im Wiener Allgemeinen Krankenhause. *Wiener Med. Wschr.* (1935) pp. 1080–1082.
61. "*A Semmelweis, dont la génie d'observation enseignait au monde de la manière de terrasser la fièvre puerpérale.*"
62. V. Robinson, Pathfinders in Medicine: Semmelweis, the Obstetrician. *Medical Review of Reviews, New York* (1912) p. 232.
63. An essay in *Budapesti Hirlap* (*Budapest News*), signed by P. R. on August 29th, 1909, under the title of "Egy magyar orvos tragédiája" (A Hungarian Doctor's Tragedy) pays great tribute to Sinclair's work, which as we have often repeated definitely admits Semmelweis's priority. Sinclair has been criticized for his attitude by English medical writers.
64. Isidor Fischer (1868–1943), Von Semmelweis zur modernen Asepsis. *Wiener Med. Wschr.* (1918) pp. 1779–1888. Fischer criticized Karl Braun for his hostile attitude towards Semmelweis. Raoul Braun (he was not a physician) in his article "Semmelweis und Karl Braun v. Fernwald" objects to what he believes to be an unreasonable and unjust criticism, and makes the statement, deserving little credit: "*War Semmelweis ein Vorläufer der modernen Antisepsis, so war Braun ein Vorläufer der modernen Asepsis.*" Cf. *Deutsche-Österreichische Tageszeitung Abendblatt* (Vienna), June 21st, 1923. Fischer repeated his

statement corroborated by evidence, in Worte der Erinnerung an Karl Braun v. Fernwald. *Wiener Med. Wschr.* (1923) pp. 1353–1354.

65. "*Tarnier venait de démonstrer scientifiquement, mathématiquement, que le 'génie épidémique' ne franchissait pas les murs de la Maternité. Certes Tarnier ne fut pas le premier à incriminer la contagiosité particulière de la fièvre puerpérale. — Mon Maître ignorait alors la géniale découverte faite par Ignace Philippe Semmelweis et dont cependant—disons le bien bas—avait eu connaissance notre Académie dans sa séance du 7 janvier 1851. Reconnaisons partout la découverte de Semmelweis.*" Cf. A. Pinard, Notice à l'occasion du centenaire de Tarnier 29 avril 1828–23 novembre 1897. *Bulletin de l'Académie Médecine* (1928) pp. 475–493.
66. "*Er hat nicht nur erkannt was die Heilung der Wunden gewährleiste, die die Erfüllungsstunde dem Frauenkörper schlägt, auch das schon eine Tat von unabschätzbaren Segen und Leistungswerte: er ist noch ganz wesentlich weiter gelangt in seiner Erkenntnis und das soll in dieser feierlichen Stunde ausdrücklich hier betont werden, weil es immer wieder verdunkelt wird, ja noch recht vielseitiger Anerkennung ermangelt: Er hat klar erkannt, was jeder Verwundung aller, Männer wie Frauen, die entstehen oder gesetzt werden, Gefahr bringt bedenklichster, oft tödlicher Schädigung und wie diese früher für unvermeidlich gehaltene Wunderkrankung mit Sicherheit verhütet werden können. Sicherer Vermeidung des Kindbettfiebers ist das in die Augen fallende directer Verdienst von I. Ph. Semmelweis. Erkenntnismässig und im gedanklichen Durchschauen ihrer Wirkungsmöglichkeit im ärztlichen das heisst in ihrer verhütenden Macht, ist die gesammte Antiseptik und Aseptik im Grunde seine Konception, sein Werk. Er erkannte nicht nur das Was, sondern auch das Wie dieses Schädigungsvorganges restlos und zugleich das Wie der Vorbeugung: in einfacher Klarheit hat er dies ausgesprochen . . . Und wir alle deutsche Vertreter historischer Erforschung und vertiefter Erschliessung der Natur und Heilwissenschaft legen freudig ihm huldigend einen Lorbeerkranz an dem Denkmal des grossen ungarischen Arztes nieder und neigen uns in Ehrfurcht vor seinem Genius, vor der Grösse seiner Tat.*" Cf. *Congressus Historicorum Medicinae Naturalis Scientiae Germ. Budapestini* (Budapest, 1929) p. 17. A német Orvos- és Természettudományi Történeti Társaság Kongresszusa (The Conference of the German Society for History of Medicine and Natural Sciences). *OH* (1929) pp. 940–942. Karl Sudhoff, *Worte der Huldigung für Semmelweis* (Budapest, 1929) p. 8.
67. Franz Bruck, Semmelweis. *Zeitschrift für Aerztliche Fortbildung* (1930) p. 24.
68. *A Királyi Magyar Pázmány Péter Tudomány Egyetem alapítása 300 éves évfordulójának jubileumi Évkönyve* (*Jubilee Yearbook of The Royal Hungarian Pázmány Péter University of Sciences at the Tercentenary of its Foundation*). Edited on behalf of The University Council by Gyula Kornis, Rector of the University (Budapest, 1936) p. 445.
69. Festsitzung für Semmelweis. Offizielles Protokoll der Gesellschaft der Ärzte. Sitzung vom 6. Juli 1947. *Wiener Klin. Wschr.* (1947) pp. 591–592.
70. No centenario da descoberta por Semmelweis da principal causa da febre puerperal. *Portugal Medico* (*Lisboa*) (1947) pp. 451–462.
71. *Lékarské Listy* (1947) pp. 413–417.
72. *Revista Espanola de Obstetricia y Ginecologia* (1950) pp. 389–401.
73. Sociedade Brasiliéra de Ginécologia. *Anais Brasilierire de Ginecologia* (1948) pp. 121–125.
74. *Amer. J. Obstet. and Gyn.*, (1948) pp. 700–710.
75. Academie Nacional de Medizine de Mexico. El grandioso descubriemento y la vida tragica de Semmelweis. *Gaceta Medica de Mexico* (1947) pp. 245–289.
76. Jahrhundertfeier für Semmelweis. *Praxis* (1948) p. 70.
77. *Journal of the International College of Surgeons* (1957) pp. 1–11.
78. *Semmelweis' gesammelte Werke. Herausgegeben und zum Theil aus dem Ungarischen übersetzt von Dr. Tiberius von Győry. Mit Unterstützung der Ungarischen Akademie der Wissenschaften.* (Jena, 1905) 604 pp.
79. *Semmelweis összegyűjtött munkái* (*Complete Works of Semmelweis*). Collected and partly translated from the German original by Tibor Győry on behalf of the Hungarian Medical Publishers (Budapest, 1906) 727 pp.

80. *Klassiker der Medizin.* Ed. by Karl Sudhoff (Leipzig, 1912) 174 pp.
81. *The Etiology, the Concept and the Prophylaxis of Childbed Fever.* Pest, Vienna, Leipzig, C. A. Hartleben's Verlags-Expedition, 1861. Medical Classics, 1941, Vol. 5, Nos 5–8, pp. 338–776. Baltimore.
82. Ignaz Philipp Semmelweis. Annotated Bibliography. *Bulletin of the History of Medicine, Baltimore*, vol. 20 (1946) pp. 653–707.
83. The memorial lecture was delivered in 1959 by István Rusznyák, Professor of Medicine, Budapest; in 1960 by Pál Gegesi Kiss, Professor of Paediatrics, Budapest; in 1961 by Antal Babics, Professor of Urology, Budapest; in 1962 by Béla Issekutz, Professor of Pharmacology, Budapest; in 1963 by György Ivanovics, Professor of Microbiology, Szeged; in 1964 by Géza Petényi, Professor of Paediatry, Budapest; in 1965 by Jenő Ernst, Professor of Medical Physics, Pécs; in 1966 by Ferenc Földvári, Professor of Dermatology, Budapest; in 1967 by József Baló, Professor of Pathological Anatomy, Budapest.
84. "*In die Entwicklung dieses Zeitraumes brachte erst einen vollständigen Umschwung das Auftreten von I. Ph. Semmelweis.*" Cf. Dohrn, *Die Geschichte der Geburtshilfe der Neuwelt* (Tübingen, 1904) p. 322.
85. "*. . . seine Grosstaten die Unsterblichkeit sichern, solange die Erde um die Sonne kreist. Sein Werk und Er leben für alle Zeiten.*" Cf. Sudhoff, *Worte der Huldigung für Semmelweis* (Budapest, 1929) p. 8.

Chronological List of Events in the Life of Semmelweis

1776, January 30th. Father of Ignác, József Semmelweis was born.
1810, January 14th. József Semmelweis and Terézia Müller marry.
1818, July 1st. Ignác Fülöp Semmelweis born in Buda.
1822. Johann Klein, professor of Innsbruck, appointed as director of 1st Obstetric Clinic of Vienna to succeed Johann Boer.
1833, Instruction of medical students and midwife students to run separately from then onwards.
1835, Semmelweis finishes humanist class II as "eminent" student in the Gymnasium of Buda.
1837. Semmelweis starts his studies in University of Vienna beginning with term: 1837–38.
1837, December 23rd. Mária Weidenhoffer, daughter of Ignác Weidenhoffer and Mária Walthier, born in Buda.
1838. Semmelweis's first term as medical student: 1838–39.
1839–40. Semmelweis continues his medical studies in University of Pest.
1843, February 13th. Oliver Wendell Holmes delivers his lecture on the contagiousness of puerperal fever in Boston.
1844. Karl Rokitansky appointed as Professor of Pathology in University of Vienna.
1844, March 26th. Terézia Müller, mother of Ignác Semmelweis dies in Buda.
1844, April 21st. Ignác Semmelweis receives title of Doctor of Medicine at the age of 26.
1844, August 1st. Semmelweis obtains degree of master of obstetrics (*magister obstetriciae*).
1844–46. Semmelweis visiting worker in Institute of Pathology and Surgery, University of Vienna.
1845, November 30th. Semmelweis obtains degree of doctor of surgery (*magister chirurgiae*).
1846, February 27th. Semmelweis received as aspirant lecturer to Professor Klein in 1st Obstetric Clinic in University of Vienna.
1846, July 1st. Semmelweis appointed lecturer.
1846, July 13th. József Semmelweis, Ignác's father dies in Buda.
1846, September 26th. Josef Skoda appointed as professor in University of Vienna.
1846, October 20th. Semmelweis's appointment as lecturer is discontinued.
1846, November. Special committee examining circumstances of high mortality rate in Klein's clinic.
1847, March 2nd–20th. Semmelweis in Italy.
1847, March 13th. Leopold Kolletschka, Professor of Forensic Medicine dies in sepsis.
1847, March 20th. Semmelweis re-appointed as lecturer in 1st Obstetric Clinic of University of Vienna.
1847, May. Semmelweis discovers cause of puerperal fever and makes the prophylactic chlorine handwash compulsory for doctors and medical students examining lying-in women. Birth of obstetric antisepsis.
1847, November 16th. James Young Simpson, Professor of Obstetrics at Edinburgh University, first administers the chloroform anaesthetic.
1847, October–November. Semmelweis discovers new factors in the aetiology of puerperal fever.
1847. Prof. Hebra issues his first article in the December number of the paper of the Medical Society of Vienna on Semmelweis's discovery.
1847, December 21st. Hermann Schwartz describes in a letter addressed to Michaelis, professor in Kiel, the Semmelweis discovery and prophylaxis.

1848–49. Bourgeois revolution and war of independence in Hungary.
1848, March 18th. Prof. Michaelis confirms in a letter favourable results with the chlorine handwash.
1848, April. Hebra's second article in Medical Society's journal on favourable reactions abroad to Semmelweis's discovery.
1848, August 9th. Gustav Adolph Michaelis, director of Kiel lying-in hospital, committed suicide by throwing himself under a train at Lehrte, a village near Hannover because he believed that the chlorine handwash clearly proved the Semmelweis doctrine and he felt that he was responsible for the death of a favourite cousin in puerperal fever.
1848, November 28th. Ch. H. Routh, English physician, lectures in London on Semmelweis's discovery.
1849, February 19th. At intervention of Professor Klein, the Ministry of Public Education annuls proposal of Medical Faculty of Vienna to send out special committee to supervise the practical and scientific implications of Semmelweis's discovery.
1849, February 23rd. At Karl Heller's suggestion the Medical Society of Vienna asked Semmelweis to discuss his theory of puerperal fever.
1849. Ferdinand Hebra is appointed Professor Extraordinary in the University of Vienna.
1849, March 20th. Appointment of Semmelweis as lecturer expires. Karl Braun is appointed as his successor.
1849, June 6th. Semmelweis becomes member of the Medical Society of Vienna.
1849, July 12th. Pest is occupied by Austrian and Russian forces and military administration is introduced in Hungary.
1849, October 18th. Skoda lectures on scientific and practical implications of Semmelweis's discovery before the Academy of Sciences of Vienna.
1850, February 9th. Semmelweis applies for docentship but his application is rejected on April 2nd. He repeats his request on May 18th and early in October is created *Privatdocent* of theoretical obstetrics.
1850, March. F. W. Scanzoni, Professor of Obstetrics and B. Seyfert, his assistant raise doubts as to the originality of Semmelweis's doctrine and the usefulness of the chlorine handwash.
1850, May 15th. Semmelweis lectures on aetiology of puerperal fever in Medical Society of Vienna under chairmanship of Prof. Rokitansky. The lecture is followed by discussions on June 18th and July 15th.
1850. End of October Semmelweis leaves Vienna for good and moves to Pest.
1851, January 7th. The Medical Academy of Paris—apropos F. H. Arneth's lecture—declares itself opposed to the Semmelweis doctrine.
1851, May 20th. Semmelweis begins work in Rochus Hospital as unsalaried physician, under an appointment signed on February 12th.
1851, October 25th. Semmelweis becomes member of Medical Society of Pest–Buda.
1854, November 25th. Ede Flórián Birly, Professor of Theoretical and Practical Obstetrics in the University of Pest, dies.
1855, July 18th. Semmelweis is appointed Professor of Theoretical and Practical Obstetrics in the University of Pest. August 27th he takes the official oath and August 30th he assumes office.
1855. In his book *Klinik der Geburtshilfe und Gynaekologie* (Erlangen, 1855) Karl Braun makes his first public attack on Semmelweis.
1856, April 1st. Semmelweis's former chief, Johann Klein, Professor of Obstetrics in Vienna, dies.
1856, December 5th. Karl Braun, Professor in the Midwives' Training College of Trient, is appointed as Klein's successor.
1857, June 4th. The first Hungarian medical journal, the *Medical Weekly* is started. From 1864 a supplement, *Gynaecology and Paediatry* appears under editorship of Semmelweis and János Bókay.

1857, June 1st. Ignác Semmelweis marries Mária Weidenhoffer, 20-year-old daughter of a Pest citizen.
1857, June 30st. Semmelweis leaves his post as chief physician in Rochus Hospital.
1857, August. Semmelweis is invited to the chair of obstetrics and gynaecology in medical faculty of University of Zürich. He declines invitation.
1857. Pasteur states that there is no fermentation without microorganisms. This lays down the principle of the microbiological origin of infections.
1858, January 2nd, 23rd and May 6th. Semmelweis discusses his teachings in three lectures before Medical Society of Pest. The text of lectures is published by *Medical Weekly*.
1858, February 23rd to July 6th. In course of lectures in Medical Academy of Paris, the Semmelweis doctrine is rejected.
1858. Virchow rejects the Semmelweis doctrine in Obstetrical Society of Berlin.
1859. The Obstetric Clinic of the University of Pest is removed to new premises in Kunewalder warehouse.
1859. Silberschmidt's monograph on puerperal fever appears. The assistant of the Clinic of Würzburg attributes the aetiology of the disease to the miasma epidemic theory.
1860, August 30th. Semmelweis's *Die Aetiology, der Begriff und die Prophylaxis des Kindbettfiebers* is ready for the press, appearing in October, dated 1861.
1860, November 27th. Semmelweis sends his book to the Hungarian Academy of Sciences. In enclosed letter Semmelweis unpredictably professes himself a Hungarian.
1861. Theodor Duka reviews the Semmelweis discovery in the *Indian Lancet*.
1861, May 22nd. Semmelweis sends his book to his English friend, Ch. Routh, gynaecologist, and to other professors of obstetrics in England.
1861. Virchow attacks Semmelweis in Speyer at the 36th Rover-Meeting of German Physicians and Nature Researchers. At same conference Lange, obstetrician in Heidelberg, declares himself in favour of Semmelweis.
1861. Semmelweis addresses Open Letters to Siebold and Scanzoni and to Späth and Scanzoni.
1862. Semmelweis addresses an Open Letter to all the professors of obstetrics.
1862, March 31st. Semmelweis addresses an appeal to Presidential Council for the introduction of preventive measures in hospital and private obstetric practice.
1862, May 7th. The University of Pest medical faculty moves that the prophylactic measures of Semmelweis be introduced into obstetric practice.
1862, September 1st. Presidential Council of Buda appeals to all municipal councils that the prophylactic measures of Semmelweis be introduced both in hospital and private obstetric practice.
1863, June 22nd. Semmelweis performs the first ovariotomy, with Professor Balassa assisting.
1863, July 4th. Huggenberger, director of the Midwives' Training College in St. Petersburg, addresses letter to Semmelweis to inform him that his teachings discussed by the Medical Society of St. Petersburg had met with approval and his aetiology of puerperal fever accepted.
1864. Joseph Lister, English surgeon, begins his investigations on a new antiseptic wound treatment.
1864. Joseph Späth, Professor of Obstetrics in Vienna, in an open confession says that no physician can reject the Semmelweis doctrine.
1864. August Hirsch, Professor of Medical History in the University of Berlin, accepts the Semmelweis theory.
1865, July 13th. According to Mrs. Semmelweis, the first signs of mental disturbance become obvious.
1865, July 31st. Semmelweis is taken to mental home in Vienna.
1865, August 13th, 11 a.m. Semmelweis dies in Lower-Austrian Mental Home.
1865, August 15th, 3 p.m. Semmelweis is buried in Schmelz cemetery of Vienna.
1865, September 30th. The rector of the University of Pest, György Schopper, pays warm tribute to memory of Semmelweis at university council meeting.

1865, October 14th. Sándor Lumnitzer, secretary of the Medical Society, pays tribute to memory of deceased members, Semmelweis and Pál Bugát.
1865. János Diescher, gynaecologist of Pest, takes over Semmelweis's vacant chair at obstetric clinic.
1867. Lister gives first account of his antiseptic carbolic treatment of wounds.
1869. Hebra is appointed *ordinarius* in Vienna university.
1872, November 2nd. József Fleischer pays tribute to the memory of Semmelweis in the Medical Society.
1874. János Diescher retires and Tivadar Kézmárszky, the loyal follower of Semmelweis, is appointed Professor of Obstetrics in the University of Pest.
1874. Virchow denies that bacteria can have pathogenic function.
1878. Robert Koch's classic book on the aetiology of wound infection, entitled *Untersuchungen über die Aetiologie der Wundinfektionskrankheiten*, is published.
1879, March 11th and 18th. In the Medical Academy of Paris, Pasteur announces the discovery of the bacteria causing puerperal fever.
1879. Semmelweis's widow and children, Margit, Béla, Antónia change their family name to Szemerényi by Ministry of the Interior authorization, December 13th, 1879.
1879. József Kovács, Professor of Surgery at Pest University, announces in public lecture that he continues to adhere to the treatment of wounds according to the Semmelweis theory, rejecting the Listerian doctrine.
1882, November 4th. Semmelweis's youngest daughter, Antónia marries Kálmán Lehoczky, high court judge in Pozsony.
1882. Professor Hegar of Freiburg publishes his book on Semmelweis and accepts his doctrine unconditionally.
1883. At Markusovszky's suggestion, a "Puerperal Committee" is appointed by the Medical Society to introduce the disinfecting method of Semmelweis into practice.
1886. R. Dohrn publishes the statistical figures of the German lying-in hospitals for the years 1874–1883 which clearly prove the correctness of the Semmelweis theory.
1891, April 17th. Semmelweis's widow makes arrangements for the remains of her husband to be transferred to Pest and interred in the mausoleum of the Walthier family in the Kerepesi cemetery.
1891, May 19th. At Kézmárszky's suggestion the medical faculty of the University of Pest appoints its Semmelweis Committee, with Kézmárszky, Árpád Bókay, Navratil and Tauffer as its members.
1891, May 23rd. Under Frigyes Korányi, the Medical Society appoints another Semmelweis Committee.
1891, June 5th. The two Semmelweis Memorial Committees merge, with Tivadar Kézmárszky and Lajos Markusovszky as chairmen and Dénes Szabó and Gusztáv Dirner as secretaries.
1891. Semmelweis's letter addressed to the Hungarian Academy of Sciences is published by *Medical Weekly*.
1893, April 21st. Lajos Markusovszky, Semmelweis's closest friend, dies.
1894, May 21st. Semmelweis's remains are removed to the Hungarian Pantheon in the Kerepesi cemetery. The tomb is the work of Albert Schikedanz.
1894, September 2nd. On the occasion of the 8th International Conference of Public Health and Demography in Budapest, the tombstone is inaugurated. In his memorial speech at the conference, Hueppe, Professor of Hygiene at Prague University, called Semmelweis the real founder of antisepsis.
1897. At the conference of German gynaecologists in Leipzig, June 9th–11th, Paul Zweifel pays tribute to Semmelweis's discovery on its 50th anniversary.
1901. The Hungarian Academy of Sciences offers a prize for the best monograph "On the History of Asepsis and Antisepsis, with Special Reference to the Teachings of Semmelweis". Vilmos Manninger is winner of first prize.

1905. The Hungarian Medical Publishers, under the auspices of the Hungarian Academy of Sciences, issue the first edition of the complete works of Semmelweis in German. Editor: Tibor Győry, who also edited the first Hungarian edition in 1906.
1906, September 29th. Semmelweis Memorial Session in Medical Society, under chairmanship of Árpád Bókay, with the memorial lecture held by T. Győry.
1906, September 30th. Semmelweis Memorial Session in the hall of the university. Semmelweis's statue is unveiled at noon of same day, followed by the placing of plaque on the house where Semmelweis was born.
1906. Foundation of the Semmelweis Cup by the Medical Casino of Budapest.
1906. Medical circles in Vienna urge that a Semmelweis statue be erected.
1907. *Münchener Medizinische Wochenschrift*, No. 14, 1907, publishes Lister's letter of September 15th, 1906, disowning a supposed statement on Semmelweis.
1908, October 21st. At inauguration of two new obstetric clinics in Vienna, a bust of Semmelweis is erected in front of the buildings.
1909. 16th Medical Conference held in Budapest pays homage to Semmelweis's statue.
1910. Semmelweis's widow, Mrs. Szemerényi, née Mária Weidenhoffer, dies.
1911. The lecture room in the Medical Society of Budapest is named after Semmelweis.
1912. Sudhoff produces in the series "Klassiker der Medizin" a shortened German version of Semmelweis's book.
1918. Medical Society of Public Hospitals establishes a Semmelweis Memorial prize and fund.
1923. A Semmelweis portrait, workmanship of Lajos Jámbor, is hung in the Semmelweis Room.
1925. Zweifel declares that Semmelweis discovered a new theory opposing the contagionists who believed in the old miasma myth.
1934, May 27th. Medical Society of Public Hospitals places a plaque on the wall of Rochus Hospital. On the same day, another memorial plaque is placed in the central building of the medical faculty of Budapest, on the wall of the staircase.
1935. Medical faculty of the University of Budapest decides to establish a medical museum to house the Semmelweis relics.
1941. First English translation of Semmelweis's book. The full text was published in Baltimore, as Nos 5–8 of the Medical Classics series. A selected bibliography of 84 items was compiled by Emerson Crosby Kelly.
1948. Emil Weil (1897–1954) moves that a Semmelweis Memorial Museum be established. At his suggestion, the central building of the Trades Union of Medical Workers is called Semmelweis House.
1957. Trade Union of Medical Workers declares the birthday of Semmelweis, July 1st, as Medical Day.
1959. Council of the Medical University of Budapest establishes a new Semmelweis prize for outstanding medical lectures to be delivered each year.
1960. Statue of Semmelweis is erected on the anniversary of the Stephen Hospital, in its yard.
1962. A statute is issued for the collection of medical relics for the future Semmelweis Historical Museum.
1963, November 6th. The remains of Semmelweis are exhumed from Kerepesi cemetery.
1964, October 11th. Semmelweis's remains find last resting place in a niche in the garden wall of the house where he was born.
1965. Declared by UNESCO Semmelweis Year.
1965, August 13th–14th. Celebrations are held in Vienna and Budapest to commemorate the anniversary of the death of Semmelweis.
1965, August 13th. Semmelweis monument in the house where he was born is inaugurated and the Semmelweis Historical Museum is opened.
1966. Memorial plaque is placed on the house where Semmelweis spent his last years (10 Váci Street).

Short Biographies of Principal Scientists Mentioned in this Book

Ambró, János (1827–1889), from 1873 Director of Midwives' Training College, Pozsony (today Bratislava). In 1844 published textbook for midwives: *Szülészeti tankönyv szülésznők számára* (*Obstetric Textbook for Midwives*) (Pozsony, 1874). He recommended the aseptic chlorine handwash in obstetric practice. Ambró dedicated his textbook for midwives written in the Slovak language in 1873 to Semmelweis.

Arányi, Lajos (1812–1887), first Professor of Pathological Anatomy in the University of Pest, 1844–1874. Also a well-known archaeological scholar.

Arneth, Franz Hektor (1818–1907), lecturer at 2nd Obstetric Clinic of Vienna when Semmelweis was in the 1st Clinic. He became later the court-physician of Helen, Grand-Duchess in St. Petersburg, subsequently *Privat-docent* and well-known practitioner in Vienna.

Auenbrugger, Leopold (1722–1809), physician in Vienna. In 1761 he published his *Inventum novum* . . . about auscultation of thoracic organs.

Autenrieth, Johann Hermann Ferdinand (1772–1835). Professor in Tübingen, physiologist, hostile to the nature-philosophy of Schelling. In his *Briefe eines Reisenden über Ungarn in 1797* he deals with his journey in Hungary.

Balassa, János (1814–1868), Professor of Surgery in the University of Pest, 1843–1868. He played an important role in organizing scientific life in medicine. He was Honorary Member of the Hungarian Academy of Sciences.

Baruch, Simon (1840–1921), American physician, Professor of Hydrotherapy in New York.

Bednar, Alois (1816–1888), paediatrician, head of department in the Alser Street Foundlings' Hospital, Vienna.

Bene, Ferenc (1773–1858), Professor of Medicine, University of Pest, 1813–1841. He played an outstanding role in organizing the scientific life of medicine. Rector of the university in 1809. Great medical educationist in the first half of the nineteenth century. His five-volume textbook of medicine (*Elementa medicinae practicae.* vols I–V, Pest, 1833–1834) made his name famous throughout Europe. Cf. Kovács, Sebestyén, Endre: Emlékbeszéd Bene Ferenc felett (In Memoriam Ferenc Bene) (Pest, 1858).

Benedek, László (1887–1945), Professor of Psychiatry in Debrecen (1921) and later in Budapest University (1934).

Berres, Joseph Edler von Perez (1796–1844), Professor of Anatomy in the University of Vienna from 1830.

Billroth, Theodor (1829–1894), celebrated surgeon of his time. University professor, 1860–1867 Zürich, 1867–1894 Vienna. His textbook of surgery: *50 Vorlesungen über die allgemeine chirurgische Pathologie und Therapie* came out in 15 editions and was translated into 10 languages.

Birly, Ede Flórián (1787–1854), Professor of Theoretical and Practical Obstetrics in the University of Pest, 1817–1854. Predecessor of Semmelweis.

Boer, Rogers Lucas Johann (1751–1835), first Professor of Obstetrics at the Vienna Lying-in Hospital, 1789–1822. Chief representative of the conservative trend in obstetrics, founder of the practice of "natural parturition".

Bókay, Árpád (1856–1919), Professor of Pharmacology in the University of Budapest, 1905–1919, balneologist. Cf. Pál Lipták, Bókay Árpád emlékezete (In memoriam Árpád Bókay). *Yearbook of the Hungarian Pharmaceutical Society* (1929) pp. 357–360.

Bókay, János (1822–1884), Director of Destitute Children's Hospital in Pest from 1852. Founder of clinical paediatry in Hungary.

Braun, Gustav August (1829–1901), brother of Karl Braun, obstetrician of Josephinum, 1861–1873, subsequently Director of Midwives' Training College in Vienna.

Braun, Karl (1822–1891), Professor Klein's assistant from 1849 to 1853, later chief physician in Midwives' Training College in Trient. Successor to Professor Klein from 1856, and until 1891 Professor of Obstetrics in the University of Vienna. Rector of Vienna University, 1868–69.

Breisky, August (1832–1889), Professor of Obstetrics, Salzburg 1866, Bern 1867, Prague 1874 and Vienna 1886. Pathologist assistant to Professor Treitz in Prague, 1855–1859. Cf. Ludwig Kleinwächter (Czernovicz), Erinnerungen an August Breisky. *Janus* (*Amsterdam*) (1904) pp. 433–482, 488–498.

Bruck, Jakab (1854–1902), assistant to József Fleischer, from 1875 consultant in Elizabeth Bath, Budapest. Member of the committee sent out by the Medical Society of Budapest to study the prophylaxis of puerperal fever in 1882, and of the Semmelweis Memorial Committee. His excellent book on Semmelweis contributed greatly to the triumph of the doctrine. Cf. R. Temesváry, Jakab Bruck (Obituary), *Gynaecologia* (1902) pp. 2–3.

Bugát, Pál (1793–1865), Professor of Theoretical Medicine in the course for surgical students in the University of Pest. Passionate supporter of the Hungarian War of Independence, chief medical superintendent of the revolutionary government of Debrecen. Founder of Hungarian medical terminology.

Busch, Dietrich Wilhelm (1788–1858), Professor of Obstetrics, Marburg, 1817–1829, and Berlin, 1830–1858. Editor of *Neue Zeitschrift für Geburtskunde*, started in 1827.

Celine, Louis Ferdinand, *see Destouches*.

Chiari, Baptist Johann (1817–1854), Professor of Obstetrics in the University of Prague (1853), later for a short time in the Josephinum of Vienna. Son-in-law of Professor Klein.

Cullingworth, James Charles (1841–1908), head of department in St. Thomas's Hospital, London, 1888, editor of the *Journal of Obstetrics and Gynaecology of the British Empire*.

Denman, Thomas (1733–1815), respectable gynaecologist in London, who insisted as early as 1801 that puerperal fever could be transferred by the physician and the midwife.

Destouches, Louis-Fernand (1894–1961), French physician, winner of Goncourt-prize. His nom de plume as a writer was Louis Ferdinand *Celine*.

Dietl, József (1804–1878), Professor of Obstetrics in Cracow, 1851–1865. He was elected rector of the university, but for political reasons was made to resign in 1865. The most radical representative of the therapeutic scepticism of the Vienna school.

Dirner, Gusztáv (1855–1912), Hungarian obstetrician, from 1898 Director of the Midwives' Training College of Budapest. Cf. *Magyar Nőgyógyászat* (*Hungarian Gynaecology*) (1923) pp. 1–2.

Dohrn, Rudolph (1813–1915), Professor of Obstetrics and Gynaecology in Königsberg, researcher of the history of obstetrics.

Duka, Theodor (1825–1908), physician and writer. He was adjutant to General Görgey in the 1848–49 War of Independence in Hungary. After the fall of the Hungarian cause he emigrated to London and finished his medical studies, becoming medical officer in the British East-Indian Army. He retired as chief medical officer in 1877 and lived subsequently in London. He pursued ethnological studies in India, collecting data on the life of Sándor Kőrösi Csoma. He wrote the latter's biography which appeared in Hungarian in Budapest. Cf. *Kőrösi Csoma Sándor dolgozatai* (*The Writings of Alexander Kőrösi Csoma*) (Budapest, 1885) p. 420, and in English in Trübner's Oriental Series, *Life and Works of Alexander Csoma de Kőrös*. A Bibliography Compiled Chiefly from hitherto Unpublished Data (London, 1885). In the Hungarian edition Duka gives a detailed description of a Tibetan medical book, discovered and published by Sándor Kőrösi Csoma in the *Journal of the Asiatic Society of Bengal*, vol. IV (1832). This is the first Tibetan medical work to appear in a European language. After his retirement Duka visited Hungary several times, lecturing on various scientific problems. In 1894 he was chairman of the International Conference for Demography and Public Health, Budapest, of the section for tropical diseases. An hon-

orary doctor's title was conferred upon him by the University of Budapest in 1889, and in 1900 he was made Honorary Member of the Hungarian Academy of Sciences. In that capacity he was requested by the Academy on April 24th, 1899 to deliver an in memoriam oration on the famous English obstetrician, Sir Thomas Spencer Wells (1818–1897), the great master of ovariotomy and Member of the Hungarian Academy of Sciences. In the wake of Baker Brown's experiments in 1863 Sir Thomas developed the established technique of ovariotomy. Cf. Aurél Stein, *Duka Tivadar emlékezete* (*In Memoriam Theodor Duka*). Memorial Lectures at the Academy (Budapest, 1913).

Eisemann, Gottfried (1795–1867), physician in Würzburg, writer and politician. He was member of the Prussian parliament and in 1848 he repeatedly raised his voice in favour of Hungary which was fighting for its independence. He was editor of *Jahresberichte* started by Karl Canstatt (1807–1850) in 1841. In his book *Die Aetiology und Prophylaxe der Wundfieber und der Kindbettfieber* (1837), he recommended chlorine oblutions against "uterine putrescence".

Elischer, Gyula (1846–1909), Professor Extraordinary in the University of Budapest, head of gynaecological department of a municipal public hospital, treasurer of the Semmelweis Memorial Committee.

Fleischer, József (1829–1877), gynaecologist, *Privat-docent* (1867), assistant to Semmelweis. His memorial speech on Semmelweis (November 2nd, 1872) is a historical record. Owing to mental disturbance he was obliged to retire from active practice in 1875.

Gordon, Alexander (1752–1799), gynaecologist in Aberdeen, a pioneer of the Semmelweis doctrine.

Gortvay, György (1892–1966), Professor Extraordinary, former director of the Hungarian Medical Library, lecturer in medical history in the Medical University of Budapest.

Győry, Tibor (1869–1938), Professor of Medical History in the medical faculty of the University of Budapest (1936), Corresponding Member of the Hungarian Academy of Sciences (1933). His name is intimately connected with the triumph of the Semmelweis doctrine, and he was regarded by international public opinion as the protagonist of the fight. Győry proved beyond doubt the Hungarian descent of Semmelweis and the priority of his discovery. In the *Jubilee Yearbook of the Medical Society of Budapest* (1937) these words can be read: "... Tibor Győry, 'the great advocate of Semmelweis' delivered his wonderful memorial lecture" (p. 251). "Tibor Győry, the excellent medical historian of our University, 'the great advocate of Semmelweis'—whose grave in the Kerepesi cemetery lies so near to that of his protégé—devoted his whole life to prove incontestably the Hungarian origin of 'the savior of mothers' against foreign accusations, standing up for the priority of his teachings as well." Cf. György Korbuly, Semmelweis a kortársak feljegyzéseiben (Semmelweis in Contemporary Records). *Orvosképzés* (*Medical Training*), vol. 30 (1940) p. 4626, Cf. also *Gyógyászat* (*Medical Practice*) (1906) p. 700.

Haen, Anton de (1704–1776), member of the first medical school in Vienna, Professor of Medicine in the University of Vienna. He introduced regular clinical observation and the regular taking of the patients' temperature.

Haller, Carl (1809–1887), head of department and deputy director in the General Hospital of Vienna. He recognized the importance of the Semmelweis discovery in surgery.

Haranghy, László (b. 1897), Professor of Pathological Anatomy in the Universities of Kolozsvár (1940–1945), Marosvásárhely (1945–1952) and Budapest (1952–1967), Corresponding Member of the Hungarian Academy of Sciences (1948).

Hebra, Ferdinand, Ritter von (1816–1880), Professor "Extraordinary" from 1849, and Professor of Dermatology from 1869, in the University of Vienna. Intimate friend of Semmelweis.

Hecker, Karl (1827–1882), Professor of Obstetrics in the University of Munich. An adversary of Semmelweis.

Hegar, Alfred (1830–1914), Professor of Obstetrics and Gynaecology in the University of Freiburg, 1864–1903. An outstanding figure in German obstetrics in the nineteenth century. Teacher of William Tauffer.

Hirsch, August (1817–1894), Professor of Medical History in the University of Berlin (1868), epidemiologist.

Hirschler, Ignác (1823–1891), oculist, first modern researcher in eye diseases in Hungary. Chairman of the Medical Society of Budapest, 1874–1880. Corresponding Member of the Hungarian Academy of Sciences (1869). He prepared notes in German about Semmelweis for Hegar.

Holmes, Oliver Wendell (1809–1894), Professor of Anatomy in Harvard University, 1847–1882. Following the late eighteenth century English contagionists, he maintained that puerperal fever was a contagious disease. He has been recognized as a distinguished writer in the United States of America.

Huggenberger, Theodor (1821–1891), Professor in the Midwives 'Training College, St. Petersburg, after 1872 Director of the Midwives' Training College, Moscow.

Hyrtl, Joseph (1811–1894), Professor of Anatomy in the Universities of Prague, 1837–1845, and Vienna, 1845–1870. He was of Hungarian descent. In 1864 he became rector of the University of Vienna. He was a master of the techniques of pathological anatomy. In his world-famous *Handbuch der praktischen Vergliederungskunst* (Wien, 1860) he described his famous injection technique. Cf. Victor Patzelt, Joseph Hyrtl. Sein Werk nach 100 Jahren. *Anatomischer Anzeiger*, vol. 103 (1956) pp. 160–175.

Jedlik, Ányos (1800–1895), Hungarian physicist, Professor of Physics in Pest University. He invented the dynamo.

Kézmárszky, Tivadar (1841–1902), successor of Semmelweis in the chair of obstetrics in the University of Budapest, from 1874 as deputy professor, from 1876 as Professor Extraordinary and from 1879 as full professor. Cf. József Lovrich, Emlékezés Kézmárszkyról (Remembering Kézmárszky). *Magyar Nőgyógyászat* (*Hungarian Gynaecology*) (1932) pp. 139–41.

Kiwisch, Franz von Rotterau (1814–1852), Professor of Obstetrics in the Universities of Würzburg, 1845–1850, and Prague, 1851–1852.

Klein, Johann (1788–1856), Professor of Obstetrics in the Universities of Salzburg, 1819–1822, and Vienna from 1822. He was Semmelweis's chief.

Koch, Robert (1843–1910), German bacteriologist, Nobel-prize winner. He discovered the causes of anthrax, cholera and tuberculosis. In the centre of his momentous discovery lies the aetiological function of various bacteria producing infectious diseases.

Kolletschka, Jakob (1803–1847), Professor of Forensic Medicine in the University of Vienna from 1843, previously for 10 years assistant to Rokitansky. Friend of Semmelweis.

Korányi, Frigyes (1828–1913), founder of modern medical training in Hungary. He started his medical studies in the University of Pest in 1844 and received his doctor's degree in 1851. Subsequently he became a surgical assistant in Vienna and, on account of an innocent remark in a letter addressed to Markusovszky in April, 1852, he was accused of treason and expelled from Vienna. From 1853 to 1864 he lived in retirement at Nagykálló. In 1864 he moved to Pest and in 1865 became *Privat-docent* of neural pathology. From 1866 to 1908 he was Professor of Medicine in the University of Budapest. Cf. Báró Korányi Frigyes emlékezete (In Memoriam Baron Frigyes Korányi). In Inaugural Lecture Delivered by Albert Berzeviczy, President of the Hungarian Academy of Sciences, on December 17th, 1928.

Kugelmann, Louis (1828–1902), physician in Hannover. Member of the First International, friend of Karl Marx.

Kussmaul, Adolf (1822–1902), Professor of Medicine in the Universities of Erlangen 1859, Freiburg 1863, Strassburg 1876 and Heidelberg 1879. He invented the stomach tube. Cf. T. H. Bast, *The Life and Time of A. Kussmaul* (New York, 1926) p. 154.

Lange, Wilhelm (1813–1881), Professor of Obstetrics in Innsbruck, 1847–1850, Prague, 1850–1851 and Heidelberg, 1851–1880.

Lebert, Hermann (1813–1878), Professor in Zürich, 1853–1859 and Breslau, until 1874. Dean of the medical faculty of Zürich University in 1857.

Lenhossék, Mihály Ignác (1773–1840), Professor of Physiology in the Universities of Pest and Vienna. *Protomedicus* of Hungary between 1825 and 1840.

Lesky, Erna, Austrian medical historian. From 1960 director of the Institute for Medical History in Vienna.

Levy, Varl Edouard Marius (1808–1866), from 1840 to his death director of a lying-in hospital in Copenhagen. Editor of *Hospitals-Meddeleser*, 1848–1853.

Liebig, Justus (1803–1873), chemist, one of the founders of physiological and agricultural chemistry, a popularizer of science. Cf. Herta von Deckend, Justus von Liebig in eigenen Zeugnissen und solchen seiner Zeitgenossen. *Sudhoffs Archiv* (1956) p. 283.

Lister, Joseph (1827–1912), English surgeon, founder of the antiseptic method in surgery. Professor of Surgery in Glasgow University, 1860–1869, Edinburgh University, 1870–1877, London, King's College, 1877–1896. Chairman of the Royal Society, 1896–1900, member of the Hungarian Academy of Sciences, 1893. First Baron, 1883, Earl, 1897. Cf. Ferenc Hutyra Lord Lister emlékezete (In Memoriam Lord Lister). Memorial lecture in the Hungarian Academy of Sciences on February 23rd, 1923. Cf. also *Népegészségügy* (*Popular Hygiene*) (1923) pp. 132–145.

Litzmann, Conrad Theodor Karl (1815–1890), Director of Obstetric Clinic Kiel, 1849–1885. Successor to the chair of Michaelis.

Lumpe, Eduard (1813–1876), obstetrician in Vienna, *Privat-docent*, Semmelweis's predecessor as lecturer in the 1st Obstetric Clinic of Vienna. His *Compendium der Geburtshilfe mit vorzüglicher Berücksichtigung an der Wiener geburtshilflichen Schule* (Wien, 1854) was extremely popular and was used as a textbook.

Markusovszky, Lajos (1815–1893), a remarkable figure in the medical profession in Hungary in the nineteenth century. A pioneer of medical science after 1867. One of Semmelweis's closest friends and supporters.

Martin, Eduard Arnold (1809–1875), Professor of Obstetrics in Jena and Berlin.

Michaelis, Gustav Adolf (1798–1848), Professor of Obstetrics in Kiel University. Founder of principle of pelvic rhomboid named after him. One of the first to adopt the teachings of Semmelweis. He committed suicide on December 9th, 1848.

Morgagni, Baptista (1682–1771), Professor in the University of Padova, founder of pathological anatomy.

Murphy, Edward William (1802–1877), obstetrician in Dublin and London.

Müller, Kálmán (1849–1926), Professor Extraordinary, director of the Rochus Hospital and of all municipal hospitals on the left bank of the Danube (1887). Chairman of the Council for Public Hygiene in Hungary, 1897–1926. In 1909 chairman of the 16th International Medical Conference, Budapest. He was nephew of Semmelweis. He spoke about his uncle in his memorial lecture on Frigyes Korányi in 1913 and in the serial *Az orvostudomány magyar mesterei* (*The Masters of Hungarian Medicine*), published by the Markusovszky Society in 1924.

Naegele, Karl Franz (1778–1851), Professor of Obstetrics in the University of Heidelberg from 1810 until his death.

Navratil, Imre (1833–1919), *Privat-docent* of laryngoscopy, 1856. From 1879 head of the surgical department of Rochus Hospital and university professor. A former student of Semmelweis.

Nyírő, Gyula (1895–1966), head of department in Lipótmező Mental Home, Budapest. From 1937 director of Angyalföld Mental Home, Budapest, subsequently director of the municipal hospital in Róbert Károly blvd. From 1951 until his death Professor of Psychiatry in the Medical University of Budapest.

Pasteur, Louis (1822–1895), French chemist, founder of modern microbiology. He discovered the bacillus causing puerperal fever (1878), the bacillus and vaccine of rabies. Cf. Pasteur Valéry Radot, *La vie de Pasteur* (Paris, 1903) and Jacques, Micolle, *Louis Pasteur. Ein Meister der wissenschaftlichen Untersuchung* (Berlin, 1959).

Pertik, Ottó (1852–1913), Professor of Pathological Anatomy in the University of Budapest. 1895–1913.

Pinard, Adolphe (1844–1934), Professor of Obstetrics in the University of Paris from 1889.

Platter, Felix (1536–1614), Basel physician, the first to consider puerperal fever as a local disease and understand its connection with inflammation of the uterus.

Plenck (*Plenk*), József Jakab (1739–1807), Professor in the Universities of Nagyszombat and Buda. Lectured in the medical faculty on surgery and ophthalmology. He produced several textbooks in Latin and German.

Regöly-Mérei, Julius (b. 1908), medical historian, palaeopathologist. *Privat-docent*, 1949.

Rokitansky, Karl (1804–1878), from 1834 Professor Extraordinary, from 1844 to 1875 Professor of Pathological Anatomy in the University of Vienna. In 1853 rector of the University of Vienna. From 1863 medical department chief in the Ministry for Public Education in Vienna. Cf. Erna Lesky, *Carl von Rokitansky. Selbstbiographie und Antrittsrede* (Graz, Wien, Köln, 1960).

Rosas, Anton (1791–1855), Professor of Ophthalmology from 1821 to 1855 in the University of Vienna. After November 1st, 1848, deputy director of the medical faculty. He was the bulwark of reaction, responsible for checking Semmelweis's career.

Routh, Charles Henry Felix (1822–1909), English gynaecologist, head of department in the Samaritan Free Hospital in London. He made the acquaintance of Semmelweis in Vienna and devoted himself to his just cause. Cf. Obituary, *Journal Obstet. Gynaec. of the British Empire* (1909) pp. 251–256.

Scanzoni, Wilhelm Friedrich (1821–1891), Professor of Obstetrics in the University of Würzburg, 1850–1888. He was rector of his university in 1853. He resigned his chair in 1888, not being able to continue in the surgical trend in gynaecology. He was a highly cultivated obstetrician of international repute. He was corresponding member of the Medical Society of Pest-Buda, 1855. His obstetric handbook which came out in four editions was the first to discuss as early as 1852 the latest results in chemistry, physiology and microscopy. Cf. *Deutsche Med. Wschr.* (1891) pp. 922–923; *Wiener Klin. Wschr.* (1891) pp. 541–542.

Schaffer, Károly (1864–1939), neurologist and brain researcher, Professor of Neurology and Psychiatry in the University of Budapest.

Schauta, Friedrich (1849–1919), Professor of Obstetrics in the University of Vienna. Director of the 1st Obstetric Clinic, Karl Braun's successor.

Schnirch, Emil (1822–1884), first director of the Lipótmező Mental Home from 1868. Between 1853 and 1860 chief medical officer of county Borsod.

Schopper, György (1819–1895), from 1855 to 1872 Professor of Dogmatics in the theological faculty of the University of Pest. From 1862 to 1865 rector of the university. In 1872 bishop of Rozsnyó.

Schönbauer, Leopold (1888–1963), surgeon, medical historian, Professor of Medical History in the University of Vienna, 1939–1960, Director of the General Hospital from 1945, Member of Parliament. He paints an objective picture of the medical culture of Vienna in his *Das medizinische Wien* (1944).

Schroeder, Karl Ludwig Ernst (1838–1887), Professor of Obstetrics in Erlangen and from 1875 in the University of Berlin. Cf. Dénes Szabó, Obituary, *Gyógyászat* (*Medical Practice*) (1887) pp. 143–144.

Schultze, Bernhard Sigismund (1826–1919), Professor of Obstetrics in the University of Jena. Cf. Aus dem Gründerjahre der Geburtshilfe und Gynaecologie. *Münch. Med. Wschr.*, vol. 99 (1957) pp. 1956–1959; B. S. Schultze, *Fortschritte der Medizin*, vol. 75 (1957) pp. 631–632.

Schürer von Waldheim, Fritz (1821–1890), Vienna physician, Semmelweis's biographer (1905), F. Hebra's nephew. He wrote the biography of Anton Messner (1930).

Schwartz, Heinrich Hermann (1821–1890), assistant to Michaelis. In 1859 Professor of Obstetrics in the University of Marburg, after the death of Siebold, in 1861, in Göttingen.

Seyfert, Bernhard (1817–1870), Scanzoni's successor as assistant in the clinic in Prague and from 1855 professor.

Siebold, Eduard Caspar Jakob (1801–1861), Professor of Obstetrics in the University of Göttingen between 1833 and 1861. A friend of Semmelweis who visited him in Pest in 1847 and 1852. His history of obstetrics, *Versuch einer Geschichte des Geburtshilfe* (Berlin, 1839–1845) was reprinted in 1901–1902, and Dohrn wrote a continuation to it.

Simpson, Sir James Young (1811–1870), from 1840 Professor of Obstetrics in the University of Edinburgh. In the beginning he did not approve of the teachings of Semmelweis, nor of Lister's antiseptic wound treatment. He introduced the chloroform anaesthetic in obstetrics.

Sinclair, Sir William J. (1846–1912), Professor of Obstetrics in the University of Manchester.

Skoda, Josef (1805–1881), from 1840 head of the department for thoracic diseases organized for him, between 1846 and 1871 Professor of Medicine in the University of Vienna. He approved the Semmelweis discovery from the beginning. Cf. Moritz Heitler (1848–1923), Professor of Medicine, "In Memoriam Skoda", a memorial lecture read before the Medical Society of Vienna, 1881.

Sonderegger, Jacob Laurenz (1820–1896), Swiss physician and hygienist.

Späth (*Spaeth*), Joseph (1823–1896), Professor of Obstetrics in the Josephinum of Vienna, 1854–1861, from 1861 to 1873 in the Midwives' Clinic, from 1873 to 1886 director of the 2nd Obstetric Clinic. He retired in 1886 because of his blindness.

Spiegelberg, Otto (1830–1881), Professor of Obstetrics in the Universities of Freiburg, Königsberg, Breslau. Corresponding Member of the Medical Society of Budapest (1874), he delivered the memorial lecture over Professor Gyula Elischer, January 13th, 1883.

Sticker, Georg (1860–1960), German medical historian.

Stoll, Maximilian (1742–1787), Professor of Medicine in the University of Vienna.

Stolz, Joseph Alexis (1803–1887), director of the lying-in hospital of Strasbourg, 1845–1870, later the permanent dean of the medical faculty of the University of Nancy.

Stöckel (*Stoeckel*), Walter (1871–1961), gynaecologist, 1905, professor in Marburg, Kiel, Leipzig and Berlin, 1926–1950.

Störck, Anton (1731–1836), Professor of Medicine in the University of Vienna, court physician.

Swieten, Gerhardt van (1700–1772), founder of the first medical school in Vienna. Chief medical officer of Austria. Cf. Wilibald Müller, *Gerhardt van Swieten. Biographischer Beitrag zur Geschichte der Aufklärung in Österreich* (Wien, 1883).

Tarnier, Etienne (1882–1897), French obstetrician. He introduced into French obstetrics Lister's antiseptic treatment in 1871.

Tauffer, Vilmos (1851–1934), from 1876 to 1878 Hegar's assistant in his clinic in Freiburg. From 1881 to 1917 director of the 2nd Obstetric and Gynaecological Clinic of Budapest University. Founder of modern Hungarian gynaecology. In 1917 he retired from the clinic and became Obstetric Commissioner of the Ministry of the Interior. He rendered important services to the cause of Hungarian midwifery and obstetrics. He organized the protection of mothers and infants. From 1927 to 1932 he functioned as chairman of the Hungarian Council for Public Health. He committed suicide at the age of 83 because of an incurable illness. Cf. Sándor Fekete, Vilmos Tauffer, 1851–1934. *Magyar Kórház* (Hungarian Hospital) (1934) pp. 307–308.

Temesváry, Rezső (1864–1944), Budapest gynaecologist, chief librarian of the Medical Society, editor of the journal *Gynaecologia* (supplement of the *Medical Weekly*), member of the Semmelweis Memorial Committee.

Tilanus, Christian Bernard (1796–1883), Professor of Surgery and Obstetrics in Amsterdam.

Toldy (Schedel), Ferenc (1805–1875), Budapest physician. Professor of Hungarian Literature in the University of Pest from 1861.

Tóth, István (1865–1935), Professor of Obstetrics and Gynaecology in the 2nd Clinic of the University of Budapest, 1917–1935. Cf. János Batizfalvy, Tóth István ravatalánál (At the Bier of Stephen Tóth). *Orvosképzés* (Medical Training) vol. 25 (1935) pp. 358–359; *Zbl. f. Gyn.* (1935) pp. 66–69.

Varnier, Henri (1859–1903), French Professor of Obstetrics, editor of *Annales de Gynécologie* and *Revue d'Obstétrique et de Pédiatrie*.

Veit, Aloys Constantin Gustav (1824–1903), Professor of Obstetrics in the University of Bonn. Protagonist in the fight for the recognition of the Semmelweis doctrine. He accepted the teachings of Semmelweis as early as 1865. Cf. *Monatschrift für Geburtskunde und Frauenkrankheiten* (1865) pp. 127–155, 161–208.

Virchow, Rudolf Karl Ludwig (1821–1902), pathologist in Berlin, 1846–1849. Professor of Pathological Anatomy, University of Würzburg, 1849–1856 (the first chair of pathological anatomy in Germany), from 1856 in the University of Berlin. His hostile attitude to Semmelweis was the greatest impediment in the triumph of his teachings.

White, Charles (1728–1813), Manchester physician. In 1773 he discovered that puerperal fever was contagious and insisted on the observance of the most scrupulous cleanliness. Cf. C. I. Cullingworth, *Charles White F. R. S. A Great Provincial Surgeon and Obstetrician of the Eighteenth Century* (London, 1904).

Widal, Georges Fernand Isidore (1862–1929), French internist and immunologist. Founder of serum-diagnostics of typhoid fever (Widal-reaction), 1896. Cf. Prof. Fernand Widal, *Lancet* (1929) *i*, p. 264.

Wieger, Friedrich (1821–1890), Professor of Dermatology and Venereal Diseases, University of Strasbourg, 1865–1886. He wrote the history of the medical faculty of Strasbourg in 1883, *Geschichte der Medizin und ihrer Lehranstalten in Strassburg von Jahren 1497–1872.*

Willis, Thomas (1621–1675), one of the greatest physicians in the seventeenth century. Professor of Anatomy and Natural History, University of Oxford, a contemporary of Sydenham. An outstanding clinician, who described many new diseases.

Zipfl, Franz (1812–1890), first *Privat-docent* of Obstetrics in Vienna University.

Zweifel, Paul (1848–1927), Professor of Obstetrics and Gynaecology, University of Leipzig, 1887–1921. He was a fervent admirer of Semmelweis. In the series of the classics of German medical science he published Semmelweis's great book on puerperal fever in 1912.

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