Pictures from the Past of the Healing Arts

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A Guidebook to the Semmelweis Museum, Library and Archives of Medical History

Second revised edition

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A Note on the Text

It is a typical feature of museum guide books, especially of those which ran through many editions, that sometimes one can hardly establish who has written any particular piece of the text. This book, at any rate, is not an exception.

The following text was originally published by the Semmelweis Museum, Library and Archives of Medical History in 1972. It was based on the Hungarian version (*Képek a gyógyítás múltjából,* appeared in the same year) and was translated into English together with a German edition. Its preface was written by our first director general, the late Professor Sándor Fekete. A valuable contribution, which studied the life, career and discovery of Ignác Philip Semmelweis, was written by the late Dr József Antall, subsequently the third director general of our institute. His aim was to present the social, cultural, and intellectual *milieu* both in Pest-Buda and Vienna which were formative in shaping Semmelweis's scientific mind and character. The longest part of the book, the guide on the main permanent exhibition of the Museum, was co-written by a number of our colleagues. József Antall, Géza Buzinkay, Anikó V. Faludi, Viola R. Harkó, Károly Kapronczay, Zoltán Pataki, István Szentgyörgyi, Mária Szlatky, Mária Vida, Tivadar Vida and Bertalan Zboray all have important task in writing the text. Much advice was provided by Professor Emil Schultheisz both in creating the conception of the exhibition and writing the commentary on it. Professor Schultheisz, together with Professor Gyula Regöly-Mérei, gave excellent professional background for the authors and also a keen eye in correcting mistakes.

A second publication came out in 1984 with a basically unchanged text. It was almost a decade later, in 1993, when I was asked by Mária Vida to revise the guide according to the different setting of the exhibition that had been developed throughout the years, and also to correct both the linguistic and some unfortunate historical misunderstandings that became obvious by then. After some consultation with Professor Schultheisz and Dr Vida a decision was taken to let me rewrite the parts that present the guide on the Museum, though keep the preface of Fekete unchanged, and re-edit the book as a whole as well.

From this edition the Hungarian and the German versions differ substantially from the English one. The book nevertheless preserved all the bests from the contribution of the 1972 edition. In respect of illustrations the help of Mrs Somorjai in selecting the best available photos was especially valuable. Similarly,

the excellent work of the photographers (both Museum staff and free lancers) supply the reader with a reminiscence of the most important pieces of our collection for ever. Magdi Vékás, Éva Fodor, Gyöngyi Fördös, Éva Füzesséry and others have done splendid work. The technical preparation of the text was proficiently executed by Mária Czinege from the Semmelweis Press of the SOTE to whom – together with Dr. Erzsébet Krúdy – I would like to express my thanks also for their generosity of allowing us to use her technical setting for this new print by the Akaprint Printing House.

This present volume is the second print of the second edition. The readiness of the staff of the Akaprint Printing House, and especially the thoughtfulness and professionalism of Mrs Molnár was obviously a great advantage.

We all hope that this short book provides our visitors with the necessary information on the Semmelweis Museum, Library and Archives. I trust that it makes your tour throughout our exhibition on the history of Hungarian and Western medical history pleasant and that it gives you an interesting account on the outstanding achievement of Ignác Semmelweis. On behalf of the fellows and staff of the Semmelweis Museum may I wish you a happy and interesting visit.

December 1999

Benedek Varga

Preface
(by Professor Sándor Fekete)

There are considerable medical historical collections in many countries of Europe, thus the foundation of a Hungarian medical historical museum was not only necessary but an urgent demand. The study of medical history is not a compulsory part of the curriculum in Hungarian medical universities, consequently the Semmelweis Medical Historical Museum is entrusted also with the task of teaching the new generation of physicians the past of the healing arts, thus contributing to the development of the medical profession's moral and historical consciousness.

An educated mind has no doubt about the necessity of a Medical Historical Museum. Today no branch of science can exist and can be developed without the knowledge of its history of development. Medical history is an organic and inseparable part of the universal history of science; if we acknowledge the latter, the research of the historical development of medicine has to be regarded as essential.

In addition to pointing out the general connections, medical history — and within its scope the medical historical museum — has a special significance. The new generation of today is confronted with all the results of medicine that have been reached so far. Without the knowledge of the history of medicine the young generation would never realize how much trouble, sacrifice and inventive imagination was required to produce this heritage, this vast knowledge in the field of medicine that has been accumulated. For example, the development of medicine and medical writing was greatly retarded by historical circumstances in the period of Turkish occupation and during the various fights for independence, lead by the Estates.

The most significant medical historian of the 18th century, *István Csanádi Weszprémi* made great efforts to collect all available data on the lives of the physicians of Hungary and Transylvania who had preceded him. Professor *Ferenc Bene*, the prominent physician of the first half of the 19th century wrote another important work: his book of five volumes, a manual of internal pathology, had been highly appreciated abroad. Real progress was achieved. However, only after the War of Independence, thanks to the school which developed around *János Balassa, Ignác Semmelweis, Lajos Markusovszky, Sándor Lumniczer, Frigyes Korányi* and later with the appearance of *József Fodor, Endre Hőgyes, Sándor Korányi* and *Vilmos Tauffer*. There was no lack in great physicians, but the state of public health and especially the availability of hospitals was most unfavourable by comparison to the countries of Western Europe. It was due to pecuniary on the one

hand and the lack of understanding on the other: the passivity of both leaders and broad masses towards public health. It will perhaps to refer to the report of *Kornél Chyzer*, medical officer in the county Zemplén to serve as an example, who speaks about the *registered* midwives being paid a few pennies, some fried dough and half a litre of brandy in return for their services at a child-birth. *Vilmos Tauffer* struggled for half century until he could change the utterly backward conditions.

Besides the general underdevelopment of public health it is worth While saying a few words about the difficulties that even the greatest minds had to scope with. *Ignác Semmelweis* had only a few beds at his disposal for proving his discovery which changed the whole field of obstetrics. But we may also refer to *Pasteur* who had to bow when entering his *laboratory*. When all the world was hostile, how deep were the roots of the *misbeliefs* they undertook to exterminate! In order to make successful research work in the future we must learn from our predecessors that knowledge combined with intuition is not enough for creating new theories and their realization in practice, but constant work, sometimes even courage are required, too, for defeating backwardness.

Beyond the sphere of healing, medical history contributes also to a deeper understanding of the deeds and personalities of great historical personalities: leading statesmen, military leaders, representatives of certain branches of art and science. The actions of many historical personalities were influenced by their state of health, e.g. the illness of Nero or Napoleon, the fracture of Emperor William's arm, etc. Victories of wars were nullified at once when an epidemic broke out in an army. The recapture of Buda from the Turks was delayed a hundred years, since the liberating army which started from the West in 1594 could reach only Esztergom due to the dysentery which devastated among them. Sándor Korányi reminds us in one of his lectures on medical history that in France there was, in the 16th century great filth and squalor even next to the Royal Palace, as Paris had not yet been paved and provided with sewerage, with contributed to the erection of Versailles Place. Magellan's long voyage round the world could not have been carried out without the observation that scurvy could be avoided by consuming onion and fresh vegetables. In the Franco-Prussian War of 1870–1871 the number of smallpox cases on the French side was higher than that of the wounded, while on the German side — thanks to the introduction of Lister's method — even the rate of recovery of the injured was influenced favourably. In the Second World War the dangerous effects of the jungle were counteracted with the use of the insecticide DDT.

Examining the question from the other aspect, we may see how far the state of public health was affected by wars. It will suffice to refer to the crusades and the spread of syphilis and leprosy which accompanied them together with various other epidemics. World War II on the other hand greatly contributed to the large scale production and use of penicillin and other antibiotics.

These examples — picked out at random from time and space — aimed only at demonstrating the significance of medico-historical research work from the viewpoint of history, cultural history and more strictly its significance in the history of the profession. Scientific research work is, however, only a part of the activity of

the Semmelweis Medical Historical Museum and Library. Its other function is to collect, preserve and scientifically catalogue the objects and documents of medical history, and present them in exhibitions. To this goes the precious collection of the Archives. The Library with the a collection of almost 100,000 volumes is an indispensable place for scientific research work and documentation. This present volume aims at introducing the reader to this manifold activity and the results of this work.

Preface to the 1972 edition

Semmelweis's birthplace — the home of the museum

(by József Antall)

Among the few remains of the old Tabán there is the house at Apród Street 1–3, where *Ignác F. Semmelweis* was born. The house stands in a charming surroundings at the Southern foot of the Castle Hill, under the reconstructed buildings of the medieval Royal Palace, the Barbican and the bulwarks of the Castle.

The old Tabán

Writing about the past of this house, chroniclers were often obsessed by its romantic atmosphere. They believed that it had harboured a medieval monastery, a Turkish harem or at least a tavern. *Apród Street*, on the other hand, is in fact of medieval origin but its old houses had been destroyed in the siege when Buda was liberated from the Turks in 1686. Its northern side where the Semmelweis House was erected had not been built up before the last decades of the 18th century. The lively and industrious *Rácz* (i.e. Serb) *Town* spreading along the busy port began to flourish when a boat-bridge was completed on the Danube in 1767. The bridge reached exactly Apród Street. Transport was increased when the Southern walls of the Castle were broken through to open the New Gate (later Ferdinand Gate, or Tabán Gate) during the reign of Joseph II (1780–1790). The opening of the gate shortened the way of burghers, merchants, shopkeepers and students to the Castle Hill.

The street which lead to the New Gate run between the Semmelweis House and the Szarvas House (Deer). It was called *Palota utca* (Palace Street) but was added later to the stretch of Apród Street, which obtained its present name in 1879. Rich merchants acquired spots of land and built houses along this busy street. The Semmelweis House in today's Apród Street 1–3, was built some time at the end of the 18th century. It was originally built in Neo-Classic Late-Baroque style. However the great fire of Tabán in 1810 destroyed the house. It was soon reconstructed and given its present *Zopf* facade. The traces of the great fire are still recognizable in some parts of the walls: some smoky clouds have been revealed at the latest reconstruction. The names of its architects have not been identified yet, neither that of the Baroque nor of the renewed *Zopf* building.

Three rizalits — one in the middle and two on both sides — give plasticity to the one-storey building with their 2+3+3+3+2 windows. They are broken up by pilasters ending in double consols which connect the ground floor and the second floor. Between the pilasters there is a row of protuberant festoon decoration in the main cornice, echoed by other festoons underneath the windows. The simple side-view looking onto Sándor-lépcső (Sándor stairs) is broken up by windows to give the wall a more animated effect. On the other side, looking onto the Szarvas-House a partition wall is waiting another attaching building. Considering the surroundings, the magnificent view up to Royal Castle, the future building needs proper and careful design.

The birthplace

The birthplace of *Ignác Semmelweis* was never owned by the Semmelweis family as it is stated in several Semmelweis monographs. This is why the question arose whether the building considered as the birthplace of Semmelweis could be connected to the Semmelweis family at all and whether this familiar and generally known belief is justified or not.

On the basis of the *Grundbuch Conscription* preserved in the *Budapest Municipal Archives* we can surely state that between 1814 and 1844 the house was owned by *János Meindl*, a wealthy tradesman and respected burgher of Buda. Between 1844 and 1852 it had been entered under the name of *Lőrinc Jankovits* and afterwards it was owned by *Leo Schallinger* and his successors. In 1906 when the Semmelweis memorial plaque was placed on the house its landlord was *Márton Wolf*, a greengrocer.

The registers of Tabán in the section of the *Buda Archives* (kept in the Budapest Municipal Archives as well) reveal the name of the owners and the tenants of the Meindl House, (that is to say this building) between 1805 and 1830. *József Semmelweis*, the father of *Ignác F. Semmelweis* lived here with his companion *Simon Gerhard* in 1809, before the great fire, as a young bachelor. He stayed here even after he had married in 1810 which coincided with the year of the great Tabán fire. In the conscriptions of 1815 the Semmelweis family is entered with indicating the three elder sons (József, Károly, Fülöp), and the servants. In 1817 the registers already recorded *Julianna Semmelweis* and in 1819 and 1821 the would-be physician *Ignác Semmelweis*. (In 1821 he is entered with his two younger brothers, *János* and *Ágoston*). At these conscriptions the actual age of the persons had been asked and the date of birth was calculated accordingly, hence divergencies easily occured.

The number of tenants also points that during the reconstructions after 1810 the house was enlarged and the number of its occupants increased to 38, from the earlier 23. Apart from the tenants, the Semmelweis family, and the landlord's family

shared the Meindl-house. Later on, three other families, the *Pfisterers*, the *Tyrnauers* and and the *Kényesis* hired also flats in the house, as did a few single persons, like *Benedek Virág*, the priest and famous poet, who stayed here in 1815, and a great number of servants. *Benedek Virág* later moved to the house opposite the street, to Apród Street 10, at the back of the Saint Catherine of Alexandria Church.

In June 1823 *József Semmelweis* informed his customers that his store were about to move to his own house, which he had purchased from *Demeter Bandy* in the previous year. The contemporary advertisement reads as follows: '*I have the honour to inform you that the grocery store I have run for 17 years* (Material, Spezerey und Farbwaren) *has been moved to a house of my own, opposite to the former one. I ask for the further kind support of my honoured customers.*'

He often advertised the products of his store, named *The White Elephant*. We have advertisements for leaf-tobacco from 1813, old wine from Mór and Csóka, and *eau de Cologne*, named *The 3 Lilies* from 1830. He played an active role in the life of the district which is well demonstrated by his position among the burghers, his advertisements of orders, his role as witness at wills and his relations to rich Greek families.

According to these documents we can conclude that the shop of *József Semmelweis* was run in the Meindl-house between 1806 and 1823, and that the family had actually lived here during these years.

The house opposite the street owned by *J. Semmelweis* had been previously owned by the influential Greek *Paziazzi* family. Later (1808–1822), it was passed into the hands of the Macedonian *Demeter Bandy*. In this house there were seven rooms upstairs, and the three-room premises of *The White Elephant* downstairs . When the store moved into this house, the family moved over too. In the registers at later dates (1827, 1830) the big *Semmelweis* family, including *Ignác Semmelweis*, was entered under this address. They had six servants who worked in the store and in the household: three assistants (*sodalis*), an apprentice (*tyro*), and a maid (*ancilla*).

The place of pilgrimage

The cult of Semmelweis, stimulated by the re-burial of his body, began to flourish at the turn of the century. At this occasion emerged the idea of marking his birthplace. The *Semmelweis Memorial Committee* decided in 1894 to place a memorial plaque on the house where Semmelweis had been born but the work was not carried out until 1906, when the Semmelweis Memorial made by *Alajos Stróbl* was unveiled as a crowning event of the International Semmelweis Celebration in Budapest. The red Swedish granite plaque was made by *Béla Seenger* and was placed onto the wall with the following inscription: '*Ignác Fülöp Semmelweis,*

Professor of Medicine, the saviour of mothers was born here in July 1st, 1818.' The memorial plaque, too, was ruined in the IInd World War and a simple marble plaque announces now: '*The birthplace of Ignác Semmelweis and the resting place of his remains.*'

It should be noted here that *Júlia Semmelweis*, whom we have mentioned above in connection with the conscriptions of the family, was still alive when the proposition about the placement of the memorial plaque at the Meindl-house emerged and she could see the perfection of this plan in 1906. Moreover she took part, in the festive celebrations with her son, *Péter Ráth*. Among the guests who attended the celebrations was Semmelweis's widow, *Mrs Semmelweis Mária Weidenhofer*, whose figure has been shown standing in front of the house in a photograph published in the *Vasárnapi Újság* (Sunday News)

Although the birthplace had been marked, no action was taken in order to save the house from decay. It nearly shared the fate of the other buildings of the old Tabán district, i.e. complete pulling-down. Where narrow streets had twisted a green park took shape and there were only a few ruins left to evoke the atmosphere of bygone centuries. The tenants left this ramshackle house too, and town planning propositions urged the pulling down of the building. Fortunately enough, the house escaped this end, but the II. World War was far less merciful and totally ignored the significance of the place.

It would be impossible to give an account of the long and tedious process that was maintained by the ardent enthusiastics of medical history and those of the conservation of monuments in order to save and restore the building which had been condemned to demolition and was severely damaged during the War.

The reconstructions were undertaken between 1962 and 1964. *Egon Pfanl*, the architect, who was entrusted with the task, had to encounter a most complicated and highly responsible work. He had to design an up-to-date museum in a partly ruined burgher's house. After restoring the original facade, the only part which has survived, he created a modern exhibition area, which is easily distinguishable from the original parts at the back of the house, in the place of the destroyed interior.

This building now houses the Semmelweis Medical Historical Museum and the remains of the great Hungarian obstetrician, which were reburied in the back stone wall of the yard on October 15th 1964.

Semmelweis returned to the place where his life began. Perhaps it has some ground to hope that his fifth grave is going to be in fact his 'final resting place'. In front of the grave there is a statue made by *Miklós Borsos*. It is a fine piece of modern art which presents a most ingenious expression of the idea of *Maternity*.

The life of Ignác Fülöp Semmelweis (1818-1865)

(by József Antall)

Hungarian medicine developed under the influence of Vienna in the 18th and 19th centuries. This city was the Mecca of Hungarian medical students, a place where they could complete their knowledge and were introduced to the most recent theories and practice of contemporary medicine. The diploma they acquired there was accepted throughout the empire.

The Habsburg rule deprived Hungary from its national independence, preserved its underdevelopment and hindered the rise of progressive Hungarian intellectual life. This judgement, however, does not contradict to the fact that the government frequently issued useful, sometimes even progressive policies which dealt with public health, public education, social security or even poor relief. They acted under the pressure of historical development but these efforts were not in vogue with the natural demands of Hungary's own progression. As Hungary's innate, autonomous development was hindered and its retrograde groups were supported, the public health and education affairs remained provincial. This does not minimize rather increases the merit of those scholars who — working among such poor conditions — undertook the improvement of public life.

During the reform era Pest became the centre of scientific activities and the rising Hungarian medical life. The medical school of Pest was formed when the new generation of physicians began to gather around *János Balassa*. This new generation reached the scientific level of the leading countries, and it had homogeneous views about medicine and public life and created a school for the succeeding generations. A hard time came upon after August 1849, the surrender at Világos, when the War of Independence was put down.

János Balassa was imprisoned, but fortunately soon released. On the initiative of *Markusovszky*, the medical men arranged riding tours and called themselves ironically *Faculté de medicine á cheval*. *Markusovszky* and *Lumniczer*, the two excellent surgeons were private assistants to Professor Balassa as soon as his chair was returned to him. The members of the Balassa-circle formed the School of Pest, which basis had been laid down during the reform period preceding the Revolution and War of Independence. Their circle extended and soon included such people as *Lajos Arányi, János Wágner, János Bókay, István Sass, Ignác Hirschler, János Czermák, Jenő Jendrassik, Kálmán Balogh* and the very first among them *Ignác Semmelweis*.

His family and the years of study

Ignác F. Semmelweis was born on July 1st 1818, in the above described house, which accommodates today the *Semmelweis Museum*. The *Semmelweis* family did not belong to the ancient families of Buda. The history of the family can be traced back to the middle of the 16th century in historical Hungary, according to the occurrence of their name. They lived in small villages in an area that had been called Western Hungary, which became part of Austria after the Great War and was given a new name: *Burgenland*. The name Semmelweis appeared in *Márczfalva* (Marz), *Szikra* (Sieggraben), *Kabold* (Kobersdorf), *Felsőpéterfa* (Oberpetersdorf) and in *Kismarton* (Eisenstadt), today all in Austria. They — just like *József Hyrtl* (1811–1894) or *Ferenc Liszt* — originated from a distinct group of Germans called the *Hintzs* (German: Haenzen, Hungarian: hienc), which were quite different from the rest of the German-speaking population of Hungary. According to some views, the *Hintzs* are believed to be descendant of Charlemagne's Franks, who had settled in Pannonia some centuries before the Hungarian Conquest. In reality it is more probable that they were fractions of Bavarian and Alemann tribes once wandering on the East side of the Alps.

József Semmelweis, (1778–1846) the father of Ignác Semmelweis was born in Kismarton. He moved to Buda and was granted the citizen-rights in 1806. In the same year he opened his grocery store, *The White Elephant*, in the Meindl-house in Tabán (seat of the Museum). He had been running his store in this house for 17 years (between 1806 and 1823), and he had rented a flat for himself and later for his family at the same place. He must have been a prosperous young man, because in 1810 he married *Terézia Müller*, the daughter of the famous, well-to-do coachbuilder, *Fülöp Müller*.

József Semmelweis's financial affluence is well demonstrated by the number of houses he owned. In 1823 they moved into one of them, apparently which stood on the opposite side of the street and this house accommodated their shop as well. They had ten children, including a stillborn baby. All the boys attended school. At the age of eleven, *Ignác Semmelweis*, having concluded his elementary schooling, began his studies at the Royal Catholic University Gymnasium up in the Castle Hill. The school was located next to the Michael Tower on today's Hess András Square. Later the school was handed over to the Piarist Order and so he had the last years (forms V and VI) at a time when these excellent educationalists had taken over the institution. His final school certificate marks him as an eminent, who was the second best, out of the sixty students in his class, who, nevertheless '*was competing with the best*'.

We ought to esteem the value of his certificate, since he attended one of the best institutions of the country. A number of famous people had received their secondary education at this school, e.g. the politician *Baron József Eötvös*, the jurist *László Szalay*, and the pathologist *Lajos Arányi*. Their teachers were probably the best instructors in Hungary. Even if we bear in mind that the educational system was

rather backward at these times, we have to refuse the rumour — spread both in Hungary and abroad — that Semmelweis was practically uneducated. Another interesting data, which should be also emphasized, is that in the official certificates the nationality of both Ignác and his brothers was marked as Hungarian (*hungarus*), whereas the nationality of non-Hungarians were usually marked as German, Croatian, Greek etc.

After he had finished gymnasium he studied at a two-year's course of philosophy at the Pest University. Complying with his father's wishes who insisted that he should become a military judge, Semmelweis enrolled as a law student in the University of Vienna in 1837. But he soon changed his mind and began his studies at the faculty of medicine. After one year in the University of Vienna Semmelweis came back to Pest, where he attended the university for two years. Then he returned again to Vienna and finished his studies there. He took his degree in 1844 and wrote his M.D. thesis on botany, entitled Tractatus de Vita Plantarum. In the same year he obtained his master's degree in midwifery and was graduated in surgery as well.

Semmelweis stayed in Vienna at a time when the Vienna School of Medicine reached its full development. The internist *Skoda* and the pathologist *Rokitansky* had not yet risen to eminence and lectured only in private courses, but they enjoyed tremendous popularity among medical students, including certainly Semmelweis. Rokitansky did not accept the views of the Old School. He denied that pathology had but a secondary role by corroborating or at the best by correcting the results of internists. He followed *Bichat*'s experiments, and enriched pathology with the aspects of patho-physiology.

Semmelweis was greatly affected by the influence of *Skoda*, the reformer of diagnostics in internal medicine and his colleague *Hebra*, who put forward a new classification of skin diseases founded on pathological observations. Their effect on Semmelweis appeared both in his medical training, his erudition and his passion for researching and the methodology of his investigations. The New Vienna School was characterized by the predominance of the new trend of pathology. They could give such answers which would never had been maintained on the basis of the examination of a living body. The collaboration of Skoda, the internist, and Rokitansky, the pathologist could show whether the internal diagnosis was right and made the control of pathological observations possible in the living organism.

Semmelweis had to choose obstetrics instead of internal medicine, since *Professor Skoda* could not offer him the post of an assistant in his medical clinic. Thus he applied for the assistant's vacant post in *Professor Klein*'s Obstetric Clinic. He had to wait for two years until he was appointed, first as temporary then as regular assistant in 1846. But during these two years he had also carried on his regular autopsy work with Rokitansky and attended the lectures of Skoda, too. Lajos Markusovszky, the other outstanding Hungarian representative of medicine, also stayed in Vienna at that time (between 1845 and 1847) as a scholarship holder. They made lifelong friendship, and Markusovszky was an ardent supporter of Semmelweis and encouraged and inspired him in all his life.

The great discovery

The *Allgemeines Krankenhaus* in Vienna was built during the reign of Emperor Joseph II (1780–1790). Its Obstetric Clinic had been already established in the first year of the opening of the hospital in 1784. In four decades the mortality rate of labouring women was as low as 1.25 percent. But in the twenties of the 19th century increased considerably. The situation did not change even after the lying-in maternity ward of the hospital had been divided into two separate clinics. Professor Klein held on the post of the director of the 1st Clinic, while Professor Bartsch was appointed head of the 2nd Clinic. A definite change was noticeable, however, from 1840, when a new regulation was created, which separated the instruction of medical students from that of the students of midwifery. The 1st Clinic was made available for medical students only, whereas the 2nd Clinic was open only to midwife students. Between 1841 and 1846 the maternal death rate in the students' hard (i.e. in the 1st Clinic) was 9.92% (1,869 died out of 20,042) as compared with 3.38% (691 out of 17,791) in the midwifes' ward (2nd Clinic).

The most dreadful outbreak ravaged between October 1841 and May 1843. There had been months (October 1842) when as much as 29.3% of all parturients had died in child-bed fever, before being able to enjoy maternal joys. The rate of maternal mortality and the remarkable difference between the two clinics arose the interest of officials, too. Commissions were sent out for investigation, but without producing any result. Puerperal fever was considered a contagious disease and was treated as an epidemic. Several theories were created about its cause: the hospital was overcrowded, the manner of attendance was rude, etc. Fears from the dangers of labouring in hospital and the difference between the two clinics soon spread over in Vienna.

Puerperal fever scarcely occurred among women who gave birth to children at home or even among the worst conditions on the outskirts. Women who was sent to the 1st Clinic did their utmost to be admitted to the clinic of *Professor Bartsch.* But, of course, it could not have been always fulfilled. Those unmarried mothers who were forced to deliver their babies in hospital in order to receive free medical assistance and hospital for their children, had little chance to make their choice. The birth rate of illegitimate children in the cities of Europe, including those of the Monarchy, was rather high, especially where soldiers were stationing. Puerperal fever took its victims and the cause of the disease had not been solved.

Semmelweis was a happy, carefree young student when arrived in Vienna. His sensitive soul, humanism, however, was greatly perturbed and deeply moved by the ravages of puerperal fever. He could not reconcile himself to the inescap-able facts of the mortality rate or the established old and recent explanations. Day after day he saw mothers in great joy and then dying, and was unable to save them. Later he himself described the history of his discovery. In his tormented state of mind '*everything seemed problematic everything was unclear, everything was du-*

bious, undecipherable, only the great number of dead was an undoubtful reality' —he noted in his diary.

His professor in pathology was Rokitansky. Semmelweis himself looked for an answer in the dissecting-room too. Each morning he conducted post-mortem examinations and the symptoms were always the same: inflammation of the arteries, the lymph vessels, the peritoneum, the pleurisy, the pericardium, and the meninx. On the basis of Skoda's elimination method, he weighed all theories which considered puerperal fever an epidemic. He refused the idea of an epidemic outbreak on account of the different mortality rates between the two clinics. There was no epidemic in the city either. No effect of the seasons could be observed in the occurrence of puerperal fever, an unusual symptom, however, in case of epidemics. Why could then the closing of the clinic stop the 'epidemic' to spread away? No 'injury through force' could be the cause. The other assumed factors (modesty, examination methods, therapy) were the same at both clinics. What could be the local cause at the 1st Clinic then, at the clinic of Professor Klein?

After a few months' work Semmelweis had to give up his post as assistant according to the previous agreement, when *Dr Breit*, his predecessor, returned. He began to learn English and wished to leave for Dublin to study obstetric techniques in a city where puerperal mortality rate was lower. Meanwhile a commission introduced severe restrictions in the clinics in Vienna to eliminate the allegedly rude examinations methods: the number of the medical students was decreased, especially that of the foreign students. And it did result the decreasing of the mortality rate! Dr Breit was not very busy in doing post-mortem examinations by himself, thus the danger of infection came to be smaller. Semmelweis was, however, soon reinstated to his post, because Breit was invited to the chair of midwifery at the University of Tübingen. Then, after so much trouble and worry, in March 1847 Semmelweis set out on a journey to Venice with his friends to relax among the historical monuments of the city.

After his return to Vienna, he started to work with renewed energy. Maternal death rate increased rapidly in April 1847 it was again as high as 18%. We know today, as he himself later also realized, that it had been mainly due to his researches. It was the most fatal way a doctor could imagine. He himself caused the death of her labouring patients when hurrying to them immediately after the post-mortem examinations.

While he was travelling abroad, his friend *Kolletschka*, professor of forensic medicine died. During an autopsy his finger had been cut by a medical student's knife. Semmelweis learned it after his return and studied the record made of Kolletschka's post-mortem. He was deeply shocked because he realized that the findings were identical with the symptoms of those who had died in puerperal fever. *'Day and night I was agitated by the report of Kolletschka's death and there was forced upon my mind with irresibile clarity the identity of this disease from which Kolletschka had died, with the other one from which I had seen so many hundreds to die in childbed.'*

Some authors are of the opinion that the role of Kolletschka's death in Semmelweis discovery is too romantic. Since Semmelweis himself refers to this at several times when reporting on his discovery, it should be accepted nevertheless, because it seems more reasonable to believe the truth of his own words than the 'critical' observations of his late biographers. Nobody questions the significance of the Vienna School in Semmelweis's discovery, the fact that it had provided him with the indispensable scientific background, searching and examining spirit. But it does not contradict after all, to the fact that the last impression, the last association, the genius glimmer of knowledge was due to the death of his friend.

Eventually, Semmelweis concluded that the infectious material which caused *cadaver fever* caused *also puerperal fever* and that the causes were in both cases one and the same: i.e. '*the cadaver particles were introduced into the blood-vascular system.*' And they were taken over by the examining physicians and medical students themselves who did post-mortem examinations and were constantly dealing with cadavers. The cadaverous matter could not be removed from the doctors' hands merely by washing them with soap and water — as the peculiar smell which was retained also revealed it. Students in midwifery were not engaged in autopsies and this explained the sharp difference of mortality rates between the two clinics.

A disinfectant was needed which could remove the '*cadaverous poison*'. After experimenting with different chemicals, he chose chlorinated lime. In May 1847 Semmelweis prescribed ablutions with chlorinated lime water. He made it compulsory for all physicians, medical students and the nursing staff.

This new measure produced amazing results: the maternal mortality rate was greatly reduced, in May it stood at 12.24% by June it had fallen to 2.38%, by July to 1.20%, and by August to 1.89 per cent.

In October 1847 a patient was admitted in the First Clinic suffering from purulent uterine cancer. Eleven out of the twelve women who shared her sick-ward died. Semmelweis realized that not only cadaverous particles could produce puerperal fever but '*any pudric organic material*' of the living organism. Consequently, he made chlorinated lime hand-wash compulsory also between each examinations. Next month another patient, suffering from carious knee-joint, infected her room-mates. It became clear that the infectious agent could be transferred to the patients not only by the putrid particle attached to the fingers of the doctors but it could also be delivered by '*atmospheric conditions*' — as they called it — i.e. by foul air loaded with exhalations from putrefying animal matter, where the putrid material could easily find its way through the air to the genitalia of other patients lying in the room.

The exact execution of chlorinated lime hand-wash resulted in a great reduction in the mortality rate, in the 1st Clinic it was 1.27%, in the 2nd Clinic 1.33%. In March and August 1848 nobody died in the clinics. Each theory that had been intended to explain the causes of puerperal fever were done away with and the *Semmelweis-doctrine* was born. He clearly defined the actiology of the disease and the ways and means for its prevention which is nothing else than asepsis, the prophylaxis of infection. This simple truth, however, proved for many not to be easily ac-

cepted. Skoda and other physicians were convinced by the results. Still his vain, jealous and regressive chief, Professor Klein, some of his colleagues, the medical students and the staff regarded the chlorine hand-wash a nuisance and refused to accept Semmelweis's theory. Annoyingly enough, Semmelweis was also sharply attacked by leading members of the profession, most notably by *Simpson* in Edinburgh, *Scanzoni* in Würtzburg, *Dubois* in Paris and *Kiwish* in Prague. Beside Skoda, only *Professor Michaelis* in Kiel accepted his discovery, who having realized that he himself had been the 'murderer' of many would-be mothers committed suicide.

Semmelweis made a fatal mistake by omitting to publish his discovery in a full, authentic text. He wrote private letters about it to his friends, because as he said later: '*my whole nature repulses from any kind of paper warfare.*' Instead of him, his friends, the members of the Second Vienna School undertook this task. Professor Hebra, the famous dermatologist referred to Semmelweis's discovery as equal in importance to Jenner's findings of small-pox vaccination. *Skoda*, the internist of great reputation, supported Semmelweis by lecturing on his discovery. This atmosphere in the Viennese medical circles was rather tense, when in 1848 revolutions broke out in Europe.

Semmelweis and the medical school of Pest

During the Hungarian revolution and War of Independence against Austria (1848–1849) Semmelweis stayed in Vienna. The revolutionary storms that reached Vienna in March caused the fall of *Duke Metternich*, and the Emperor agreed on the formation of the Academic Legion and the National Guard. Among the members of the latter, which was actually a less revolutionary force we can find Hebra, Hyrtl and Semmelweis, too. However, the National Legion was disbanded when the second revolution of Vienna (October 6th, 1848) broke out. It is unlikely that Semmelweis was a member of the Academic Legion, and he could only be the member of the National Guard, in the spring months. Had he taken a more active part in the events his reactionary colleagues Rosas and Klein, would have been quick to use the proofs of the behaviour of the reformers, and above all that of Semmelweis, to discredit them. He could, continue his career as obstetrician and fought for the vindication of his discovery.

It would be equally wrong to consider him a revolutionary hero — though there was no doubt about his sympathy for the principles of the revolution — or to be hostile to his nation in the days of struggle for independence.

On March 20th 1849 his appointment as assistant professor at the Clinic expired. His request for its renewal was rejected by Klein and Rosas. Later he applied for a recognition as private *Dozent* (9th February 1850) and asked to be allowed to demonstrate on '*phantoms*' (models) and cadavers but was refused again. In his next

petition of 9th May he even accepted the restriction not to use cadavers and to demonstrate only on phantoms '*until the cadaver-question would completely settled*'. His friends persuaded him to deliver a lecture for the distinguished *Medical Society of Vienna* on May 15th 1850, which was chaired by Professor Rokitansky. It was followed by two discussions in consecutive meetings. His ideas were objected and triumphed in the last months of his stay in Vienna. Eventually, his appointment as private *Dozent* arrived on October 10th 1850 '*with the restriction that my practical demonstrations could only be done on phantoms.*' In the same month he suddenly left Vienna and returned to Pest.

His disillusions are not considered by many to be serious enough to drive him away from Vienna. We learn from a letter he wrote to Markusovszky that in the meantime he had visited Pest. His colleagues, the members of the emerging 'School of Pest', Balassa and Markusovszky, too might have urged him to return home. Though he settled in Budapest again, he found later, however, that the situation was not much better there either. His friends, the most eminent representatives of the Pest Medical School had fought for the rebirth of a new, civic Hungary and served during the revolution as military surgeons.

A hard time came upon them after August 1849, the surrender at *Világos*. The Balassa-circle was to substitute for the lack of social organizations and scientific institutions abolished or oppressed by Austrian neo-absolutism. The lack of medical literature came to be more and more awkward because the *Orvosi Tár* (Medical Magazine) ceased to exist in 1849. At last the *Orvosi Hetilap* (Medical Weekly) came out in 1857 edited by Markusovszky. It was the forum of the School of Pest, the papers of Balassa were published there and the article of Semmelweis was first published in it. Balassa was a man of public life, the head of the society, but the real organizer of Hungarian medical life and also of medical publications was Markusovszky. In 1863 Markusovszky founded the *Hungarian Medical Publishing Society*, and at the same time, as private physician to the Baron Eötvös and Trefort families he established important political connections.

In the period of the dual monarchy from 1867 medical life was characterized by busy public atmosphere but also by clique isolation. This period tried to transform the country to a modern European power, and in the reform plans for the administration of higher education and public health, Semmelweis also had an active part.

The state of affairs were, however, rather miserable. In the Medical Faculty there were five small rooms for parturients. The windows of the *St. Rochus Hospital* looked onto the dissecting room. The head of the hospital was at the same time professor of midwifery, surgery and pathology. *Birly*, the professor of midwifery tried to fight against puerperal fever by giving the patients purgatives. Under the pressure of circumstances Semmelweis received an appointment as unsalaried honorary head of the maternity ward of the *St. Rochus Hospital.* In six years time he achieved that only 0.85% of his patients died from puerperal fever. Professor Birly died in 1855 and Semmelweis was appointed Professor of Theoretical and Practical Obstetrics at the University of Pest. This appointment meant not only a chair at the university but a complete recognition of his activities which he could not have

been able to maintain in Vienna. He was professor in the University of Pest only for ten years, but this period was of immense importance in the life of the Medical Faculty, in such an extent that the Medical Faculty of the Budapest University was named after him in 1969. He struggled with unbelievable energy against the elimination of the dangers of infection. Hundreds of obstetricians and midwifes spread away his doctrine in Hungary.

In 1857 a new period began in his life. He refused an invitation for the university of Zürich. He was encouraged by Markusovszky, to publish his doctrine in the Medical Weekly established by that time. He described his theories on puerperal fever, the story of discovery and the difference between his opinion and those of the English obstetricians, who believed that puerperal fever was a specific contagious disease.

Meanwhile, he married *Mária Weidenhofer*. Unfortunately, out of his five children only three had survived and only one had further descendants.

His articles in the *Medical Weekly*, though accurate and important, were not sufficient enough to justify the reality of his theory against the big number of opponents. Only a major book, written in an internationally recognized academic language, could fulfill this task. His work the *Aethiologie der Begriff und die Prophylaxis des Kindbettfiebers* came out at the end of 1861. It contains everything about the history of his discovery: discussions, doubts and successes. His work is a basic and thorough medical work, an exact statistical document, a memoir of direct tone and an argumentation of refined irony at the same time. He went on attacking his opponents with his *Open letters* written in German in the following years, in 1861 and in 1862. His tone became more and more sarcastic. Few things can effect anyone to loose temper more than the continual lack of comprehension. His chief opponents were Spaeth, Siebold and Scanzoni. He wrote to the latter: '*You have demonstrated Herr Hofrath* (court councillor), *that in a new hospital like yours, which has been accommodated with the most modern furnishing and appliances, a good deal of homicide can be committed, providing one has the indispensable talent to carry it out.*' Among his other opponents we find the French Academy as well as *Professor Virchow.*

His illness and death

The last years passed in bitter emotions and melancholy. He continued, however, his work and theoretical activity, and greatly contributed to the rise of gynaecology in Hungary. His doctrine was favourably accepted by the obstetricians of St Petersburg and he was somewhat comforted by this recognition. By the middle of July in 1865 his mental health seemed to had been weakened in the cause of his controversies with unbelieving colleagues. This mental insanity became quite obvious on a faculty meeting of the university when instead of making his vote he began to read out the text of the midwifes' oath. His astounded col-

leagues took him home. Professor Balassa, Bókay and Wágner, the most eminent professors of the University of Pest examined him. On July 3rd 1865 he was admitted to Vienna and placed in the care of an asylum. He was accompanied there by Professor Hebra. He wanted to walk out but was restrained. Hardly a fortnight later on August 13th 1865 Ignác Semmelweis died.

The immediate cause of his death was that some days before the faculty meeting he had cut the middle finger of his right hand, apparently while performing an operation. The wound became suppurated, his arm inflamed, he suffered from paroxysm. The process spread over his whole organism. The autopsy record stated *pyaemia* (sepsis). His early death was actually caused by the same infection that parturients had been died of. Parturients, for whom he had been struggling in all of his life. This is the real tragedy of Semmelweis's passionate and restless life.

'*There were three entirely independent phases in the mental illness of Semmelweis. The first, that of psychopathia, culminated around 1861 but never developed into insanity. The second phase was a chronic degeneration of the nervous system, probably paralysis. It progressed in gradual stages from 1861 onwards and became acute in the summer of 1865. The third phase, the acute infectious mental disturbance was due to a neglected osteomyelitis which developed in the mental hospital in Vienna. His death was caused by pyaemia.*' — wrote the historian Professor István Benedek in 1974.

The significance of Semmelweis's discovery transcended obstetrics. It had its effects on surgery and medicine in general. His discovery was completely verified by the rise of bacteriology, through the activities of *Pasteaur* and *Koch*.

There was a long discussion in medical literature about the priority of the work of the American *Holmes*, the English Joseph *Lister* and Semmelweis. No doubt, it was *Lister*, who introduced the use of carbolic acid spray in surgery in order to destroy *pyogenic* germs. *Semmelweis* on the other hand stressed the significance of the prophylaxis of infection.

Each scientific discovery has its predecessors, and numerous parallels can be discovered in the proposed methods. But the question of priority at the basic question, the discovery of the fact that puerperal fever and sepsis are one and the same cannot be dubious, it was undoubtedly a conclusion of *Semmelweis*'s genius.

Ignác Fülöp Semmelweis is the greatest international authority of Hungarian medicine. His birthplace, the seat of the Medical Historical Museum is a worthy memorial of the great man. His life and work, birth an death, struggles and achievements inspire everyone who enter this house and they make it a place of pilgrimage for those who fight for human and scientific ideals.

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Pictures from the Past of the Healing Arts (Guide to the Exhibition)

I. Medicine in the antiquity and during the Middle Ages

Medicine is almost as old as man himself. His instincts, needs and experience taught man the art of healing.

In the first part of the exhibition we have presented the period from the Neolithic to the Late Middle Ages. The material here illustrates to such outstanding peaks of ancient medicine as the eight Egyptian medical papyri, Hippocrates and the Classical Greek School, the great physicians of the Roman Empire, and Arabic medicine.

Whereas the primitive curing of prehistoric man was often imbued with superstitions and fear of the unknown forces of nature, classical Oriental medicine made clear observations on the natural world. Nevertheless, it happened later in *Kos*, a Greek island, that Hippocrates and his followers elaborated an entirely rational system which was based on the classification of the symptoms of different diseases. The medical knowledge of ancient Greece was further developed by Roman physicians, especially in the field of surgery.

After the decline of the Byzantine medicine, which produced a medical theory of strict, unchangeable schemes, the scientific results of Hellenism were preserved, and in some respects further developed by the Islam.

1. Prehistoric and primitive medicine

Producing reasonable explanation about the causes of different diseases was certainly beyond the limits of prehistoric curing. We can surely say that in this period medicine was characteristically based on superstitions, misbeliefs and mystical theories. Within the limits of their knowledge, however, they made good use of their rudimentary instruments. Collecting drug plants that might be applied as pain-killers they have begun a practice surviving ever since.

Among the first displays of our exhibition you can see two idols from the Neolithic period. The one presenting the figure of a woman (No. 10) is a cultic progenitrix. The other one that has an elliptic form is known as a vulva (No.10) i.e. a symbol

of fertility. The trephined skull of a woman (No.11), which is from the times when Hungarian tribes conquered the Carpathian Basin (c. 896. A.D.), is an interesting find from the point of medical history. The re-grown of the bone tissues around the trepanation hole proves that the patient managed to survive the dangerous operation.

The *curare* is a herbal extract originated in the today Venezuela. It was usually kept in hollowed or scooped pumpkins. Medically, it has a double effect on human body, when in the viscera (bowels) it works as a spasmolytic liquid, whereas injected into the vascular system it is a deadly poison. The latter was exactly why the native tribes of Amazonia had invented it. The *tsantsa*, is a contracted skull used by the Indians of South-America as a fetish. The skull of the killed enemy was shrank, slung over the warriors neck or shoulder and was regarded to be magically potent.

The so called diagnostic bones and the drugs of a witch-doctor (medicine man) (No.1), from South-Africa, represent the method of healing among Bantu tribes hundreds of years ago. The pulverized drug was kept in a goat horn (No.6) obviously in order to preserve it dry. We show furthermore, a mask (No.3) that was used for expelling diseases from human body and a snake-fetish (No.4) made of gazelle horn.

2. Medicine in the Ancient Orient

The written history of medicine begins with the terra-cotta tablets (*ostrakas*) of Babylon and the Old-Egyptian medical papyri. It would be quite logical to suppose that the high standard of mummification required a detailed exploration of the secrets of human body, therefore it must have had a beneficial effect on Egyptian anatomy. Nevertheless, according to Egyptian thought, the priests of *Sechmet*, who stood for medical profession along the Lower Nile, did consider the dead body unclean, so they kept away from dissection and from all stages of mummification processes. These were carried out by specialists instead, the *embalmers*, who lived in separated communities, mind you, in the necropolis. The embalmers lacked medical education and were unable to apply their knowledge of the human body to curing. Paradoxically, the physicians had collected all their anatomical perception from animal dissections.

The head of a mummy in the middle of the show-case is from the Ptolemaic age. It has been very well preserved: the eyes are still in the eye-hole, and there is not any sign of artificial operation on the skull that would uncover that the brain had been dissected. In ancient Egypt medical profession and magic were hardly separated. The goal of mummification was a magical preparation for transcendental life.

There are five amulets in the case. The first one, out of the four that are placed in a line (No.14), is an *Ujat-eye* that were used for protection against the witch's malevolent look. The next one (No.16), modeling a heart, symbolises the blood of *Isis*. The so called *Jed-pillar* (No.15) represents the backbone of *Osiris* and was

used to demonstrate *constantia* (constancy). The last amulet (No.17) is an *Uaj-pillar* which was used in order to safeguard re-awakening or rebirth. The blue scarabeus amulet (No.13) made of faïence, placed above the others, is surprisingly big. It had a similar purpose i.e. it was used for assuring survival and resurrection.

The photo showing the temple of *Com-Ombo* (No.12) that illustrates surgical and obstetrical equipment gives a good impression about the excellence of Egyptian surgery and midewifery.

3. Greek and Roman medicine

We have presented the reliefs, that illustrate Greek and Roman medicine, together in the same show-case.

Hippocrates (460–377 B.C.), the most famous doctor in ancient Greece, was titled as Father of Medicine. His medical school and sanatorium on the island of *Kos* developed such principles and methods in curing that have been used ever since. We have exhibited a book, (*Magni Hippocratis Coi opera omnia*, Leyden 1665), which is a bilingual, Latin and Greek compendium of his works. It contains everything that had been ascribed to Hippocrates up to the 17th century. We know today that the number of texts, which were undoubtedly written by him, is much smaller. The tiny statuette of Hippocrates (No.3) portrays the doctor in classical style. It was made by an unknown French sculptor in the 18th century.

There is a row of Greek coins in the cabinet (No.4.) which have some medical reference. Two of them on the left were made in Pergamon in the 2nd century B.C. Both is illustrated with *Asclepios'* portraits on their reverse. The other three are as follows: a Thracian, with a *Hygeia* figure, AD 175; a Phrygian, with an *Asclepios*, 2nd c. AD; and one from *Martia Nopolis* (Moesia Inferior), with Asclepios' snake on the reverse, from the 2nd century B.C.

There are a few statuettes from the Hellenistic period (c. 330–30 B.C.) on show. Because the figures present pathological deformations some of the scholars have supposed that they might have been used for demonstrations in the medical school of Smyrna.

Half a millenium after Hippocrates *Galen* (130–200 AD), another young Greek from Pergamon began his studies in the medical schools of Smyrna, and continued it in Corinth and Alexandria. This man became the other most distinguished physician of the ancient world later. His writings had been among the most basic texts in every medical curriculum until *Andreas Vesalius* (1514–1564), the famous Dutch anatomist, published his more accurate descriptions of human body in 1543. Moreover, Galen's physiology had been unchallenged until William Harvey's (1578–1657) discovery of blood circulation in 1628. Nevertheless, the opus of Galen still kept an important place in anatomical education. The front page of his *Anatomia* published in Leyden in 1651 refers his longstanding influence (No.12).

The third famous representative of classical medicine, *Dioscurides Pedianos* (c. 40–90 AD), was born in *Anazarba*, Asia Minor. Like many of his compatriots he joined the Roman imperial army and served as a military doctor. Travelling with the army around the empire he had become accustomed to a great variety of plants and trees. He applied this vast knowledge when writing his major work the *Peri hyles iatrikes* (*De Materia Medica*), which involves five books, describing plants, oils and minerals. This book was the other most frequently used classical textbook in medieval times, beside the works of Galen. The separate sheet in the case (No.19) is from this book. The *Peri hyles iatrikes* was thoroughly commented, and revised by the outstanding Italian *Pietro Andrea Mattioli* (1500–1577) in his *Il Dioscoride con gli suoi discorsi aggiuntovi etc.* (Venice 1544). These commentaries, that is to say, the opuses of Dioscurides Pedianos and Mattioli altogether, became the foundations of non-chemical, modern pharmacology.

There are many finds from the Roman times, in the show-case, that were excavated in *Pannonia*. Transdanubia, as we may call it geographically, came under Roman sovereignty in the beginning of the first century AD, the province itself was organized in 9 AD. These finds inform us also about the trade connections of the different Roman provinces. The glass vessels (No.7) had been produced in Italy and *Germania*, then were imported to *Pannonia*. They used these glass containers for storing different oils and make-ups (No.10). The surgical instruments have been excavated in *Aquincum*, the Roman antecedent of Budapest. Have a look of the bronze scalpel: note, that the shape of scalpels has hardly changed during the past eighteen centuries.

There are a few Roman amulets from the imperial age on show, and two Etruscan votive objects from the 2nd century B.C., i.e. a foot and a symbolic phallus (No.5).

4. Islam and the public health

There were two basic components in the culture of the Islam: Arabic language and Muslim religion. In their greatest age the territory they controlled was impressively large. It covered all lands from Northern India to the Frank Empire. Significantly, during the first period of the Islam, the culture of the conquered nations like those of the Persians, the Aramians, the Copts, the Jews, the Greek diaspora around the Levante, and those of the Central Asian peoples, had been preserved more or less intact. Muslim medical writings took over the results of a tremendously large area that had a great variety of cultures. The Nestorian Christian physicians had particularly affected Arabic medicine. These influences, combined with the Muslim thought, brought about a specific synthesis. In a certain extent the Islam further developed classical Greek and Oriental medicine, mainly by its accurate observations. Islamic culture flourished from the 8th to the 14th centuries.

The sacred book of Islam, the *Koran*, contains detailed orders how a believer should run his or her life. Some of these rules about washing and fasting refer simply to hygiene, but others are clearly about sanitary matters. The enlarged photo above the show-case, illustrates the latter. It is an extract from a *sura* (chapter) of the Koran, and regulates sanitary matters.

The most famous representative of Muslim medicine was probably *Avicenna* (*Abu Ali al-Husain ibn Abdullah ibn Sina*, 979–1037). Avicenna was born in Bukhara and spent all his life in the Eastern regions of the Muslim world. He studied the Koran, Arabic and Greek classics, philosophy, mathematics, astronomy and medicine in Bukhara. Later, he worked as court physician and scientific adviser to many of the rulers of Eastern cities, like Khwarazm, Karzwin, Hamadan and Isfahan. His most influential work, composed in five books, the *Canon Medicinae* by its Latin name, was a masterpiece of Arabic science. This work is actually an encyclopaedia of contemporary medicine, which combines the doctrines of Hippocrates and Galen, the principles of Aristotle with the accurate clinical observations of a couple of Muslim physicians, like e.g. those of the famous *Rhazes* (ar-Razi) (865-d.c.923). Avicenna's work was poorly translated into Latin by *Gerard of Cremona* (1114–1187), but it was still used as a major textbook in European universities until the middle of the seventeenth century and even the Arabic text itself was edited at Rome as late as in 1593. The exhibited copy was published in 1658 at Louvain.

The coloured slide shows a picture from a 14th-century codex the *De Chyrurgia* (On surgery); (the original one is in the possession of the *University Library of Budapest*). This book is a Latin translation of the manual of another prominent Arab physician and surgeon, *Abulcasis (Abu-l-Quasim, or Khalaf ibn al-Abbas uz-Zahrawi)* (c. 91?–1009). Abulcasis lived in Cordoba, as the physician to the Caliph Abdur Rahman III (912–961). The codex, which is actually a manual, is thoroughly illustrated with drawings showing surgical instruments, curing and operation methods, like e.g. one about the extension of the vertebrae. This text is an extract from the third part of his main work, the *Kitab at-Tasrif li-man' ajiza* (On the application of medical knowledge), which was one of the biggest encyclopaedic book in the Middle Ages. This definitely long piece of work which contains thirty *maqalats* (tracts), where the first is about *physiology*, the second is on *nosology* and the third is on surgery. His works were translated into Latin also by Gerard of Cremona, and circulated in forms of codices under various titles. The many printed editions from the late 16th up to the 18th century show that his book, and especially its second part, had been an extremely useful manual for all practicing doctors in Europe for quite a long time. The first printed edition of his texts, entitled *Liber theoricae nec non practicae Alsharavii* appeared in Augsburg (1519), still using Cremona's three-hundred years old translation. His tracts on surgery, entitled as *Cyrurgia cum formis instrumentorum* were printed at the first time at Oxford, 1778.

We have also displayed a few Arabic amulets that were supposed to have health protecting effects, moreover a few vessels and jars. (No.3 and 4)

Maimonides, Rabbi Moses Ben Maimon or by his Arab name *Mose Majmuni* (1138–1204) was a distinguished Jewish philosopher, master of Rabbinic literature and court physician to the world-famous Sultan Sala-ud-din (1138–1193). Maimonides was born in Cordoba and was educated by his father and many Arab masters. Later he had to leave the Iberian peninsula and settled first in Fez but soon moved on to Cairo. He was most well-known about his philosophical treatise *The Guide for the Perplexed.* Nevertheless, his other texts are indispensable sources for the public health of the Arabic, Jewish and other communities of the contemporary Muslim world. We have commemorated him with a copy of a page from his other famous work, the *Misneh Tora* (No. 2), which was written in 1180, (The original codex is in the possession of the *Library of the Hungarian Academy of Sciences*). This book contains descriptions about some customs of late 12th century Jewish life under Arab rule in Iberia and Northern Africa.

5. Medicine in medieval Europe

Scholastic medicine was the other great school beside the Arabic in medieval times. It probably had lasted by the middle of the 15th century. The period from the 6th to the 12th centuries is usually labelled as monastic medicine. At that time nursing and healing were regarded as part of the mission of the monastic orders. The monks could read in Latin and combined their knowledge obtained through observation with the elements of classical medicine and natural sciences.

From the 12th century onwards education at most of the universities was based on reading the classics of antiquity. Medical tuition was not an exception at all. Practice, and especially surgical practice was pushed into the background. Scholastic medicine was probably well characterized by the words of *Arnoldus de Villanova* (1235–1312) who pointed: '*The physicians of Paris study only for the sake of the university and not in order to obtain knowledge and practical skill.*'

We have presented medieval medicine in two glass-cases. The first one illustrates Hungarian medical practice, mainly from the period of the first Hungarian royal dynasty, the *Árpáds* (1000–1301). The oldest object you can see here, is a trephined skull of a 30 years old man (No. 15.); (from the collection of the *József Attila Múzeum, Nyíregyháza*). It was found in a grave of a Hungarian warrior at *Rétközberencs* (Upper Tisza area), and it is dated from the times of the Hungarian conquest of the Carpathian Basin, c.896 AD. The hole on the top of the skull was covered with a silver plate.

The text of a *benedictio* (No.12), placed on the right wall of the case, is from the *Codex Pray* (written between 1192 and 1195; the original one is in the collection of the *National Széchényi Library*). Its application enlightens the lack of obstetrical practice of these times: by merely citing the text the pain of the parturient was supposed to be relieved.

The cilice or penitence belt of St. Marguerite of Antiocheia (No.11) is a copy. The original one is in the collection of the Treasury of the Esztergom Cathedral. It was used by the Clarissa nuns of Pozsony (today Bratislava, capital of Slovakia) on a similar purpose. In order to help the parturient the belt was placed on her waist.

Europe's population was frequently decimated by epidemics during the Middle Ages. Leprosy, plague, (*haemorrhagic*) smallpox and ergotism were the most regular ones. The sick were usually expelled from the rest of society, and there were the religious orders which tried to organize their care.

You can see a roll (No.6) above the skull, which was issued in 1346; it tells us that on the site of the today *Hotel Gellért*, the *Hospitale Ecclesiae Sanctae Elisabethae* was built, an institution run by the Order of the Knights of St. John.

The coloured photos show altar-pieces of the churches of *Bártfa* (today Bardejov in Slovakia) and from *Kassa* (today Košice in Slovakia) (No.1). The paintings were made in memoriam of *Saint Elizabeth* (1207–1231). She was another member of the *Árpád* dynasty, who married to a German *Markgraf* when fifteen, and had several children. She was deeply religious and devoted her life to sick care. Her early death came in a cloister in *Marburg* (Thüringia) when she was only 24 years old, in 1231. Due to the many miracles that were ascribed to her she was soon canonised in 1235. The painter has presented the princess in a *leprosarium* (i.e. in a hospital for lepers) when giving a bath to a group of sick, and curing their wounds.

Another remembrance from this period is a charter of the Johannita Convent of *Budafelhévíz* from 1290 (No. 10). This monastery with a hospital was built around the today Buda side of the *Margit Bridge* in Budapest.

The other charter you can see here was sealed by *Peter of Bologna* (No.9), *protonotarius* of Pope Eugenius IV. (*pontificat* 1431–1447). According to the charter, Peter promised indulgence for all who had contributed donations to the *Hospital of St. Gellért.*

The pharmaceutical mortar on the right is a Hungarian make from the 14th century (No.10). It was excavated in Pozsony. The rests are a pharmaceutical case (15th century), a leper medal (1539) (No.3), a plague coin (1527) (No.4), a few alchemist coins (No.14) and an astrologer's amulet (17th century) (No.13).

The next glass-cabinet presents medical literature and equipment of late medieval times. These pictures remind us the life of the universities.

The book in the show-case, entitled *Das ist das Buch der Cirurgia* is the work of *Hieronymus Braunschwig* (1450–1533) (No.8.), and was published in Augsburg 1597. It was one of the first German surgical works that have ever been printed. There is an interesting surgical instrument, an *earscoop* (No.6.) in the cabinet, dated from the beginning of the 16th century. This one was found at the excavations of the medieval walls of *Eger Castle* in Hungary. Next to it you can see a few ribbed Gothic pharmaceutical mortars (No.12) manufactured between the 14th-16th centuries.

Our oldest apothecary jar (No.7) was produced in *Faenza* (Italy) some time between 1520 and 1530. The French term itself, *faïence*, was originally used for the

porzellana di Faenza, a fine kind of glazed and painted earthenware invented in this Northern Italian city. This particular jar is an *albarello* by its form. Albarelli are high and slender earthenware, for standing close together on the shelves of a pharmacy, with contracted waist for easier grasping when the jar is taken down. Handles are sometimes added to it. Drug-pots of all shapes are often painted with the name of their contents, as a rule, on a label or ribbon nearly encompassing them. The minuscule inscription of this one reads: *g.d.ocha*. It was imported from *Portogruaro*, a small town in *Veneto*.

An interesting 15th-century manuscript was found in a deck of an incunabulum (No.7). It is a summary of prescriptions, and medical advices to avoid *vertigo* and *porrigo*, and medical information about the physiological effects of fig and black currant.

The copy of a pair of lenses (No.9), were made of leather in the 15th century is an early product of modern European medical handicraft. The chastity belt (No.16) from the 16–17th century was a rather rude instrument for guaranteeing the trustworthiness of one's spouse.

II. The birth of modern medicine

The critical attitude of modern scholarship strengthened by the Renaissance demanded the revaluation of the classics. From the times of Turkish victories over Byzantium and especially when Constantinople had fallen in 1453 hundreds of Greek scholars fled to Europe, mostly to Venice, Rome and Florence. This emigration greatly contributed to the renewal of classical scholarship, by the mere fact, that these men could read classical Greek authors. The invention of printing, on the other hand, made the newly translated works accessible to an ever increasing number of readers. Thirdly, as a result of the geographical discoveries new drugs (e.g. *ipecacuana, guaiacum, chinin*) came to be used in medical practice.

Renaissance art paid more attention to accurate depiction or portrayal of human anatomy. Speaking about arts we must mention the Italian *Leonardo da Vinci* (1452–1519), who was one of the pioneers of modern anatomy too, though he studied the anatomy of human body for his artistic purposes. Scientific anatomy, on the other hand, reached its highest level in early modern times with the works of *Andreas Vesalius* (1514–1564). Vesalius regarded anatomy as a science indispensable for medicine.

The religious wars contributed to the development of practical medicine, and above all to the renewal of surgery. The most prominent military surgeon was probably *Ambroise Paré* (1510–1590). Though Pare had obtained his practical knowledge on battlefields as a military surgeon, he perceived the importance of anatomical knowledge based on Vesalius's descriptions, and thus opened a completely new era in the history of surgery. Another outstanding figure of these times

was *Paracelsus* (1493–1541) professor at the University of Basle, who was said to have publicly burned the books of both *Galen* and *Avicenna* to give an unfaltering form to his conviction that healing must be based on direct experience. England has also given a genius to medicine, namely *William Harvey* (1578–1657), who renewed physiology by discovering blood circulation. Though not a physician, *Anton van Leeuwenhoek* (1632–1723), the great scientist of the Netherlands, made name for himself in the history of medicine by inventing microscope.

1. Rebirth of medicine in the 16th–17th centuries

a) Vesalius and modern anatomy

Andreas Vesalius (1514–1564) (No.6), the founder of modern anatomy was son of a court pharmacist in Brussels. Even as a young boy he was interested in natural sciences, especially in anatomy. He had began his studies at the University of Louvain, where he learned Hebrew, Greek, Latin and Arabic, moved to the famous University of Paris to study medicine under *Jacob Sylvius* (1478–1555), the celebrated anatomist of his age. Jacob Sylvius was an enthusiastic believer in Galen and did not bother that Galen's anatomy had turned out to be in sharp contradiction to many contemporary observations. Vesalius left Paris and returned to Louvain and then paid a visit to Brussels. In Louvain he started his continual, and in the beginning, secret dissections. However, he was graduated as Doctor of Medicine at Padua in 1537. He was appointed professor of surgery and anatomy at the same university, so young as 24 years old. He worked with passionate energy and unfailing diligence. He completed the manuscript of his fundamental work on August 1 1542. The book, entitled *De humani corporis fabrica libri septem* (The Fabric of Human Body in Seven Books) (No.7), was printed at the famous Oporinus printing house in Basle, 1543. This work of 663 folios and 300 woodcuts opened up a new era in the history of anatomy. Its significance is due to the fact that Vesalius cleared anatomy of the false, inaccurate and unreliable views of Galen, which were often based on analogies of animal-dissections.

The illustrator of his book was probably *Jan Stephan van Calcar* (1499–1546), a Dutchman who belonged to the school of Tizian. For a long time the drawings were attributed to Tizian himself. This issue, that you can see in the case, was published in Nüremberg in 1551.

In front of the book there is a wooden anatomical figure from the turn of the 17th–18th centuries (No.4). The two delicate ivory figures (No.11) below, are specially noteworthy: they are detachable figures and were used for demonstration in lecturing obstetrics. They were probably made by *Stephan Zick* (1639–1715), a famous master of ivory carving in Nüremberg. Though their anatomical structure represents pre-Vesalian anatomical knowledge, according to their style they still belong to the middle of the 17th century. In the background of the show-case you

can see a medical diploma from the late 16th century (No.5). It was issued to *Valerius Bellatus* at Venice in 1575.

There are also some commemorating medals of Vesalius (No.9) and *Nicolaus Tulp* (1593–1674), the other eminent Netherlander, who appears in *Rembrandt*'s famous *Master Tulp's Anatomy*.

University anatomical education is illustrated by the copperplate of the *theatrum anatomicum* at Leyden (No.13). The plate was made by *Jacobus Harrewijn* (c. 1660 – d. after 1732). A good example of the anatomical views of these times is Albert Dührer's (1471-1528) self portrait (No.8), in which the artist reveals his liver disease.

b) Paré founder of modern surgery

In the Middle Ages surgeons occupied lower ranks in society than physicians. They had their training together with the barbers, consequently their scientific knowledge was poor. In contrast, doctors attended universities and their activities were focused on more or less, what we call today, internal medicine, not to speak about their serious studies on natural sciences in general.

Among the innumerable results of the devastating wars in the 16–17th centuries we can find the rapid development of surgery. *Ambroise Paré*'s (1510–1590) (No.3) career is an excellent example of the growing importance of this profession. He spent most of his long life on battlefields but he was gifted enough to become a master of surgery. He had no formal education; his ignorance in classical languages obstructed him to study even the basic texts of science. However, his excellence in his chosen profession was greatly awarded when he was appointed head surgeon of the respected *Collège de Saint-Come*. It was experience and sometimes luck that lead him to new, and quite logical conclusions. Observing that wounds caused by firearms are basically different from the poisoned ones (which was contrary to the general view of his age) he introduced a new healing method for these injuries by neglecting cautery. Over this question he had a dispute with *Giovanni de Vigo* (1460–1517), the court surgeon of the *Curia* in Rome. Later, when *Jacques Dubois* (1478–1555), appointed him to a a post in pathology, Paré did express his doubts on Dubois's anatomical views, which were rather in favour of Galen, and he presented himself as an advocate of the anatomy of Vesalius instead. His other main contribution to modern surgery, beside the application of Vesalius's anatomy, was the renewal of vascular compression.

You can see a copy of a Latin edition of his major work, the *Opera Chirurgica* (Paris, 1582) on display (No.6). His first book, the *La Methode de traicter les playes faictes par hacquebetus* was published in Paris 1545, and his completed works, *Les ouvres de M. Ambroise Paré* in 1575.

Next to the illustration of *haemostasis* from the *Feldbuch der Wundarznei* (No.2.) by *Hans von Gersdorff* (published at Strassburg 1517), you can see cauterising-irons (No. 1.), from the early 16th century. His book was written apparently

for field-surgeons. Note that their shape did hardly change from the medieval times well until the 19th century.

c) The discovery of blood-circulation

Galen (130–200 AD) '*whose genius inspired medicine for one and a half millenia but whose influence obstructed progress as well*' — had already recognized that blood is moving in the arteries but could not solve the question of circulation completely. Erroneously, he considered the liver as the central organ of the vascular system and the producer of fresh blood. He also believed that blood could pass through the separating heart wall (i.e. from the right into the left ventricle). He described the directions of blood movements and the location of the arteries quite correctly, but did not recognize the continuous circulation of blood. Galen's physiological system is shown in a diagram.

Vesalius had already ascertained that the *septum* between the right and left *ventricles* is complete, though he could not completely deny the existence of invisible pores, which were mentioned by Galen.

Realdo Colombo (1516–1559) a pupil of Vesalius who succeded him in his chair at Padua, and who gave lessons in anatomy to *Michelangelo* dealt with the same question too. In his major book, the *De re anatomica libri XV* (Venice 1559) he pointed out that there was no movement through the heart's dividing wall between the *auricles* and *ventricles* and also that blood was oxygenated in the lungs.

Another forerunner of the discovery of blood-circulation was *Miguel de Serveto* (Michel Seruetus, Villanovanus, de Villeneufve) (1511–1553), a Spanish physician and theologian who discovered the lesser or pulmonary circulation. He mentioned in his major theologian work, the *Christiani restitutio* (Vienna 1553) that according to the complete separation of the two ventricles and the large size of pulmonary arteries, there is a communication in the lungs by which blood passes from the pulmonary artery to the pulmonary vein.

It was discovered in 1924, however, that *Ibn an-Nafis* (1210–1288) an Arabic physician of the 13th century '*had already formulated that the interventricular septum is solid and he also referred to the pulmonary circulation.*'

The anatomical interest of the University of Padua, preserving Vesalius's heritage greatly contributed to the discovery of blood circulation. *Johannes Caius* (Kees, Keys or Kay) (1510–1573), who was the second founder by his generous donation of the Goldwille and Caius College at Cambridge in 1557, had studied anatomy under the celebrated Vesalius and Montanus at Padua in the 1530s. By obtaining a grant in 1564 for the college to have annually the bodies of two malefactors for dissection Dr Caius became a pioneer in advancing the study of anatomy in England, and had an intermediate role in Harvey's discovery.

William Harvey (1578–1657) was born five years after Caius's death. He was educated at the Caius College, Cambridge. Then, as many students from this college, proceeded to Padua to study medicine under *Hyeronimus Fabricius ab Aquapendente* (Girolamo Fabrizi) (1537–1619). Fabricius the eminent teacher had set

forth a refined description about the system of valves in the veins in his *De venerum ostiolis* (1603). He had suggested that the valves obstruct blood to flow back to the limbs and allow it only to direct centrally even from parts of the body that are below the heart. Harvey's studies at Padua were characteristically inspired by these theories on the function of venous valves. After he had been graduated in medicine in April 1602 he returned to England and settled in London. In 1609 he obtained the post of physician to St. Bartholomew's Hospital. Among his many celebrated patients were the Lord Chancellor Francis Bacon, the Earl of Arundel and two royal persons, James I., and Charles I.

In 1616 he began a course of lectures at the College of Physicians in which he first brought forward his views upon the movements of the heart and blood. Nevertheless, it came about but twelve years later in 1628 that he published the *Exercitatio anatomica de motu cordis et sanguinis* (An Anatomical Disquisition Concerning the Motion of the Heart and the Blood), his tract about blood movements that were based on the results of his experiments and comparative investigations of animals. The epoch-making work was published in *Frankfurt am Main*. Harvey's discovery gave rise to a violent controversy among anatomists whose majority insisted: '*It is preferable to be wrong together with Galen than acknowledge Harvey's truth*'. Harvey did not defend his thesis against the attacks. His fundamental discovery did not need any further explanation, it stood for itself and eventually, during his lifetime, received admiration. Harvey's way of thinking is well characterized by his famous statement: '*A question raised correctly is already a significant step towards the correct answer.*'

A coloured illustration represents Harvey's doctrine; the enlarged photo shows his portrait (No.17) and you can also see his signature.

And you can see a facsimile copy of his diploma (No.15) and the original copy of his other famous work, the *Exercitationes de Generatione Animalium* (Disquisitions Concerning the Generation of Animals) published in Amsterdam, 1662 (No. 14).

2. The discovery of the microscope and theories of medicine in the 16th–17th centuries

The first microscope was a simple system of magnifying glasses, co-built probably by two Dutchmen: *Zacharias* and *Johann Jansen* before 1600. *Galileo Galilei* (1564–1642) receiving the news of its construction decided to fabricate his own instrument, which he named *occhialino* (monocle). These first magnifiers, which might have been used by keeping them in hands, were mainly for fun like e.g. flea watching. Microscope, the term itself was first mentioned in a letter of Johan Faber (1570–1640), a court physician to Pope Orban VIII (*pontificat* 1623–1644), in 1625.

The application of microscope to the study of animal and vegetable structure produced interesting results in the labours of Marcello Malpighi (1628–1694). His discoveries were so important that he may be considered to be the founder of

microscopic anatomy. He published his observations in his *De Pulmonis Observationis* in Bologna, 1661, which was a further contribution to blood movements. Although Harvey had correctly inferred the existence of the capillary circulation he had never seen it, but Malpighi did saw, apparently in the first time in human history, the blood coursing through a network of small tubes on the surface of the lung. Malpighi's book contained also the first account of vesicular structure of the human lung.

Anton van Leeuwenhoek (Antonie van Leeuwenhoek) (1632–1723), a Dutch microscopist was another important person in manufacturing microscopes and study the minute structures of organized bodies by their aid. A famous inventor he was though had not been medically or scientifically trained, he invented new systems of magnifying lenses, by using single lenses with very short focus. He made a series but disconnected discoveries which were, however, accurate descriptions of, beside others, blood capillaries, and red blood corpuscles. From the point of medical history his most important achievement was by all means the description and illustration of the first micro-organism that had ever been seen by man, in 1683.

Robert Hooke (1635–1703) an English experimental physicist, whose scientific achievements would probably have been more striking if they had been less varied, also used a microscope for his observations. Investigating the structure of corkwood he invented a name for its smallest, tiny parts, the *cellulae* i.e. cells in his *Micrographia* in 1664.

The foundations of medical chemistry (iatro-chemistry)

The character and interests of *Paracelsus*, (Philippus Aureolus Theophrastus Bombastus Paracelsus ab Hohenheim) (1493–1541), were so rich in contradictions, that they have been a favourite subject for the historians of science for centuries. He was a typical representative of universal man: physician, alchemist, philosopher and theologian; it seems easier to enumerate the things he did not deal with during his adventurous life. As a physician he was more or less a *specialist* in surgery, anatomy, pathology, botany and pharmacology, though there is no proof of his formal education and received degrees in medicine. After *Girolamo Fracastori* (1483–1553) and long before *Bernardio Ramazzini* (1633–1714) he was the first to study occupational illnesses and wrote a special study on a common disease of miners. He did not employ alchemy for making gold or transmuting base metals into noble ones, but wanted to form it the foundation of pharmacology. His theories were sometimes built upon the base created by ancient authors even if he had publicly rejected them, but after all his ingenious, though often bold way of thinking produced new, heterodox views which he tried to implement into practice. We have presented one of his books, the *Theil der Bucher und Schriften* (Basel 1589) (No.3) and a medal in memory of him (No.2).

3. Medicine in Hungary in the 16th–17th centuries

After the devastating defeat at *Mohács* in 1526, which was partly due to the overwhelming power of the Ottoman Empire but to internal conflicts as well, Hungary was cut into three parts. One was occupied by the Turks, the second remained loyal to the King, who happened to be a Habsburg, and the third one, *Transylvania*, tried and sometimes were able to preserve independence from both other powers.

During the fifteen decades of Turkish rule, there was actually a continual war between these three parts of Hungary. Obviously, in the struggle for survival there was virtually no place left for sciences. Hungarian scholars worked abroad, spreading all over in Europe. The most important representatives of medicine or those of the related subjects were as follows:

János Zsámboki (1531–1584) who worked at the imperial court of Vienna. He spoke fourteen languages and was called a *giant of erudition* (*monstrum eruditionis*). We have presented his *Emblemata et aliquot nummi etc.* published at Leiden in 1590 (No.7);

György Henisch (1549–1585), who was the first to describe the *morbus hungaricus* (typhoid fever), was forced to leave for Brünn (Brno in Bohemia) on account of the jealousy of his colleagues. He is one of those writers who acquired a reputation by analysing the mineral waters of Hungary. He pointed out, moreover, that syphilis can be infectious even without sexual intercourse.

János Bánfihunyadi (1576–c. 1650) taught geometry at *Gresham College*, an institution of the Mercer's Company, in London, but dealt with alchemy too.

János Jeszenszky (Jessenius) (1566–1621) called himself a *Hungarian nobleman* though he spent all of his life abroad. Born and educated in Breslau (today Wroclaw in Poland) in a Hungarian family in-exile, he continued his studies in Wittenberg and Padua, where he was graduated in medicine in 1591. He returned to Wittenberg to become a professor of medicine and physician to the Princes of Saxony. It was the *Kaiser, Rudolf II* (reg. 1576–1612, King of Hungary as Rudolf I 1576–1608) who had invited him to Prague to the chair of the professor in medicine at the Charles University, where Jessenius became appointed rector a few years later in 1617. Jessenius was the first to perform a public dissection in Prague in 1600. Taking part in the rebellion of the Czech estates (1618–1621) he was captured after the battle at White Mountain (1621) by the Habsburg forces, found guilty in high treason and was brutally executed. You can see his important surgical tract the *Anweisung zur Wund Arzney* (Instructions for Wound Surgery) (No.9), published in Nüremberg in 1674, in the show-case. Moreover, one of the most beautiful medals of our rich numismatic collection, the commemoration medal of Jessenius's rectorship (1617), made of silver, is also on display here (No.10).

Ferenc Pápai Páriz (1649–1716) was graduated as a doctor of medicine in Basle in 1664. Returning to Hungary he became medical officer in Debrecen but later settled in *Nagyenyed* (today Aiud in Romania), where he was a professor at

the *College of Nagyenyed*, which had been his alma mater. You can see an issue of his most significant and popular work the *Pax Corporis (Peace of the Body)*, (Kolozsvár 1747) in the show-case (No.17). He has set out his objectives in the preface as follows: *'As far as I know there has not been any work written on this matter in our language so far'*. In this book he arranged the medical knowledge of his age in a plain, popular form, especially for those *'living in the countryside, where a sick animal gets medical aid sooner than a sick man...'* Though under a Latin title his eminent work was written in Hungarian.

The first printed pharmaceutical tract in Hungarian, which was basically a botanical digest explaining the effects of different plants, was written by *Péter Melius Juhász* (1532?–1572), under the usual title *Herbarium* (1578) (No.4).

The number of historical relics from this age is obviously small. In the showcase you can see a small stemmed pharmacy vessel, made of glass in the 17th century, which is considered the oldest Hungarian make drug-pot in the collection of the Museum. The long-shaped, blue oil-container, which is a more roughly fabricated glass-work, is from the same period.

17th century pharmacology is illustrated by the set of glass jars, each labelled accurately (No.11), and by a painted wooden Baroque container (No. 8). The ginger can, made of pewter (1690) (No.3), and the bronze mortar (No.6) are both from Transylvania.

A valuable piece is the silver sipping vessel of *Count Mihály Teleki* (1634–1691), Chancellor of Transylvania (No.15). This vessel is decorated with his coat-of arms and the enumeration of all his titles, and was made at the year of his death. The paralized, elderly nobleman, who lost all his teeth, used this vessel to avoid swallowing fishbone.

During this period common folk acquired lots of its knowledge about curing from calenders. The *Almanac of Lőcse* (the city is called today Levoča in Slovakia) (No.12), containing regulations for *venesection*, wet-cupping and bathing, was published in 1692. Some interesting original accounts of the Hospital of Sopron (No.2) dating from 1586 are also displayed here.

On the label of one of the early-baroque wooden pharmacy vessels one can see both the marks of the alchemists and the Latin inscription of the drugs. The tin ginger-containers were made in the 17th-18th century. The pear-shaped stemmed vessel is probably the most interesting among them. The seals of the surgeons' guilds in Tokaj and Győr (No.14) represent the surgery documents of the 17th century.

Next to the glass-cabinet stands a medium size pharmacy armoire from the *Kígyó* (Slag) *Pharmacy*, Győr. Behind the doors there is a row of drawers each labeled with a Latin letter.

Above the armoire, there is an oval portray of *David Spielenberger* (1627–1684), who was a city-physician of Lőcse in Upper Hungary. He was also the private doctor of *Baron Ferenc Wesselényi, Palatinus* of Hungary, (the palatinus in Latin or *nádor* in Hungarian was the highest rank after the king in historical Hun-

gary), and of *Countess Mária Széchy*. The painting was probably made by his brother János Spielenberg.

4. Pictures of surgery and medicine

The religious wars of the reformation put new themes about the life on battlefields and in camps, onto the agenda of painters. An unknown Netherlander artist made the *Ambulance Station in a Camp* oil-painting on a hexagonal copper plate. The painting presents the 1621–1639 Spanish–Holland War. If we compare the illustrations of the contemporary surgery tract, (placed beneath the picture), which are about the application of surgical instruments and techniques for removing bullets from human body, to the picture we can find the Netherlander artist's impression fairly accurate. A similar theme has been visualized by a 18th century German painter in *The Wounded Cavalry Officer*, a small size oil painting.

As a logical consequence of the new attitudes of the Renaissance the depiction of daily life of common people became a popular subject for painters. The greatest home of genre paintings was indeed Holland, a classical territory of civic life. This school flourished especially in Rembrandt's time. Quite often in the pictures of Flamand and Dutch painters we can meet the studies of physicians, laboratories of pharmacologists or the operation theatres of surgeons. During the 17th and 18th centuries the newly developed methods of medicine, like *urinalysis* and *sphygmoscopy*, also appeared in these paintings. This scenes are often visualized in exotic or mythological forms. The picture that shows Achilles while curing Telephos with the iron filings of his lance was made by an unknown painter. It is a good representation of a 17th-century surgical treatment for wound dressing. The coloured draft of an Italian artist from the 18th century is about *sphygmoscopy*: Eristratos examining the melancholic Antoichos' pulse.

The visit of the doctors was another usual topic of the painters. Occasionally you can even meet with the humour of Netherlander artists: sometimes the patient happens to be a young lady who has but love sick. Still, even these paintings illustrate contemporary medical practice, consequently, they are good sources for the medical historian. *Jacob Toorenvliet*'s (1635/36–1719) painting falls into this category. A young lady is examined by a doctor who holds a urinalysing tube towards the light, while counting the pulse of his patient. (From the collection of the *Szépművészeti Múzeum*, Budapest.)

The German *Johann Christian Fiedler's* (1697–1765) *Examination* is a similar oil-painting made on a copperplate in rococo style. A young lady sitting in a velvet armchair looking into the doctor's face in need of help, who holds a urinalysing tube in his left hand and examines her pulse with his right.

III. The rise and development of pharmacy in the 16th–18th centuries

Establishing the exact date when pharmaceutics became an independent science in European scholarship may only be maintained arbitrarily. We can rather speak about a long process where many factors contributed to this development: a gradual separation of actual healing from manufacturing medicines; commercial factors that caused the stocks of drug-stores, originally containing various goods, to be reduced exclusively to medicines, and last but not least the reforms introduced in the training of pharmacists. Whereas in the beginning an examination was to be taken before the county-physician, later a university degree was generally required. The introduction of new drugs, due to the imports from newly discovered islands and continents also had a considerable part in this process.

Paracelsus's role was indispensable in the further increase of the stock of medicaments. The introduction of new tools and instruments also promoted the development of pharmaceutical technology. Alchemy, the once hermetic science, was replaced by iatro-chemistry. The revolution of the natural sciences in the 18th century opened a new era in the history of science. Instead of running after unrealistic dreams, like looking for the secret of metal transmutation, gold-making or the philosophers' stone, a new attitude came about which desired to establish solid scientific truths. The bands of quacks, charlatans and amateurs found themselves on the fringes of society for the very reason of their ill-reputation. Educated pharmacists, on the other hand, acquired reputed positions in society. Their prestige was in balance with their scientific knowledge. Commercial interests compelled the chemists to supply their pharmacies and laboratories with the best available equipment. Moreover, official decrees made the use of the more hygienic glazed faïence and glass pharmacy jars compulsory.

Generally speaking progress in Hungary during the 16th and 17th centuries fell behind the European level. As a result of the Turkish occupation (until the end of the 17th century), Habsburg oppression, the division of the country into three parts, the counter-reformation, and all the consequent differences compelled scientist to seek fame abroad. Pharmaceutics was certainly also effected. There were only a few pharmacies all over in Hungary, but in the Turkish occupied territories even those that had existed fell victims to destruction. The number of trained pharmacist remained relatively small. More favourable conditions were brought about only from the 18th century.

1. Faïence apothecary jars

Italian Renaissance faïence pottery is illustrated with majolica jars. As we have mentioned above the word *faïence* has derived from the Italian city of *Faenza*. The

majolica, on the other hand, is properly applied to a species of Italian ware in which the 'body' is coated with a tin-enamel (white tin glaze), on which is laid and fired a painted decoration. According to some scholars the first time when a tin glaze for pottery took place was about the 9th century in the Near East. The technique was developed in order to provide an imitation of the white porcelain, an imitation which was easily colour-painted as well. This art spread westward through the Islamic lands to Spain and ultimately made its way to Italy. To this Italian type of painted earthenware with white tin glaze came the term *maiolica* be applied sometime in the 14th century. It has usually been supposed that the name was used for this type of pottery believed to have been made in the island of *Mallorca*, but it is more probable that the name was given by Italians to the lustred, opaque Spanish earthenware imported *by* ships coming from the *Balearic* islands. However, by the 16th century *maiolica* became a widely used term for all tin-glazed earthenware, lustred or not, firstly in Italy but soon in other countries as well. Occasionally it has been also applied to similar wares made in imitation of the Italian ones elsewhere.

The non-transparent white tin glaze was an excellent background for the rich colours of the Italian painting — refined in the service of Church art — so they could appear in their full brightness on the apothecary jars. The special value of majolica-painting lies in the delicate brushwork which often reveals a brilliant skill. The glazed cover preserves every single touch for ever, therefore correction is virtually impossible. The second, or fixing firing covers the surface with a never-fading shine and preserves the original radiance of the colours.

The shapes of the jars underwent some changes too. The rounded shapes of the *albarelli* originated also in the Far-East came to be higher and slender, actually like a spindle. Apart from stylistic development, practical reasons might also have contributed to reshaping the jars: a more cylindrical one is more easy to be grasped when taken off from the shelves. Various syrups were kept in lipped jugs. The large, round-shaped vessels with wide orifice contained leaves of herbs or their powdered extracts. We can surely say that the transformation of pharmaceutical jars was a result of the mutual effect of stylistic changes and the development of pharmaceutical technology.

The displayed collection of pharmacy jars begins with an albarello decorated with the head of an angel. It was probably produced in a workshop of *Palermo* about 1600 (No.4). Next to in there is an oblong albarello from Sicily (*Caltagirone*) from the 17th century (No.5). The jug bearing the antique inscription *S.DE.ABSO* and decorated with wreaths of leaves against blue background derives from the workshop of *Domenico da Venezia* (1560–1570) (No.8). Its counterpart is an oil container from *Castel Durante* from the beginning of the 17th century (No.1). The cylindrical jar decorated with Fortuna's figure standing on the river-side and labelled *DIAMOSCHI* is a product of the same workshop but had been manufactured earlier (probably about 1580) (No.2). Moreover there is an artistic spindle-shaped albarello, produced in Palermo in the 1660s. This is decorated with yellow and brown *trofeo* design and the figure of the *Maiestas domini* (No.3). The

powder-pot manufactured in *Trapani* about 1630 is decorated with acantus-leaves design on a blue background (No.16). Two jugs complete the collection presented in the show-case: the first one derives from the workshop of *Levantino of Albissola* (Savona) from the 17th century (No.15), whereas the other one was a product of the *Pescetto* workshop in the same town a century later (No.11). There stand beside the glass case a Louis Seize cabinet of double door, inlaid with walnut wood from the '*Saracen*' pharmacy in Pécs founded in 1692.

2. Mementos of the plague epidemics

Although did not belong to pharmaceutical history proper, the fightings against epidemics contributed to the development of medicine.

The painting, by a *follower of Giuseppe Maria Crespi* (1665–1747), made about 1700, reminds us the plagues of the 17–18th centuries. It shows Saint Rochus, defender of the pestilentials, treating infected people. The dark background stands in a strong contrast with the lights of the front giving a dramatic expression of the terrible epidemic which threatened the mere existence of so many European cities. The saint standing in a dark suit in the middle of a crowd is about to aspirate the wound of a sick. There is another strong contrast on the right side, where a pale young mother holds a dead baby on her breast. The background depicts a scene from the Old Testament: King David is offering a sacrifice for the recovery of pestilentials. Next to the oil painting there is a painted wood-statue of St. Rochus. The saint, who is guarded by his typical escort a faithful dog, points to the wounds of a sick.

3. Pharmaceutics in Hungary in the 17th and 18th centuries

In 16th and 17th century Hungary there was no parliamentary regulation of pharmacy matters. This respectable profession was regarded an *ars libera* (free trade) and was not brought under the control of the guilds. The licence for setting up a pharmacy was considered a *jus municipale* (municipal right) and only the royal decree of 1759 introduced the principle that the grant of licence for opening a pharmacy belongs to the *jus regale* (royal right). Pharmacists were trained in apothecaries, their certificates were issued by the owner of the shop and this was sufficient for starting to run a pharmacy on their own. In 1753, however, a decree was issued which introduced a compulsory examination for pharmacist conducted by a municipal or a county medical officer and since 1774 pharmacies may have been run only by those who had passed this examination. The *Generale Normativum* issued in 1770 brought about a complete change in the training of pharmacists. They had to attend a three months' university course, which was extended

four years later to twelwe months at the *University of Nagyszombat* (today Trnava in Slovakia).

On the big modern shelve in the next room, pharmaceutical remembrances from the 17th and 18th century are presented. The coloured map in the middle left shows those pharmacies of Hungary, that had been founded before 1750 and were still in service in the late 19th century. Note the poor health supply of the middle region, the *Alföld*, in contrast to the northern parts. This difference was still due to the Turkish occupation, though this had been put down by the late 17th century. The apothecary jars around the map present an outline of the history of European pharmaceutical faïence ceramics. This was predominated by Italian earthenwares too, so the pharmaceutical jars you find here are mostly from various Italian cities. Starting on the left side of the map the two albarelli are from *Pesaro*, (North Italy), as well as the two armorial jars above them. The globular jar at the top left is from *Trapani*, Sicily (early 17th c.). Turning to the right, the albarello on the right of the next string of jars, is also from *Pesaro* (early 17th c.), as well as the next armorial jar (c. 1750) in the middle. The small albarello on the left of it is from Northern Italy (middle 17th c.), whereas the other smaller one on the right was made in *Savona*, Liguria (early 17th c.). The big ovoid jar, with the portrait of a young man, was made in *Venice* (late 16th c.). Below, at the right in the next string, there is a jar from *Talavera dela Reina*, Old Castilia (late 17th c.).

On the top of the next column there are three glass bottles from the 17th c. Out of these three albarelli, the left one was made in Spain (late 17th c.), the next two, are both decorated with the double headed crowned eagles, which were the stylized court of arms of the Habsburg family. In the next row below, the biggest jar in the middle is another Italian albarello, which was made in *Caltagirone*, Sicily (early 17th c.). On the right there is a short footed drug pot, painted in blue, with the black inscription; this one was manufactured in *Savona*, Liguria (18th c.).

The string of glass jars bellow the map, and also the wooden pharmaceutical jars on the right, are Hungarian makes from the 18th c.

The three small hand-scales on the right were made in Austria and in Hungary. Some of them has the Austrian certification signs from the 18th century at the bottom of the platters. Each pieces of the set of weights (middle 19th c.), placed on the right of the shelve has the official Austrian measurement units on the tops as well; i.e. 1 Austrian pound = 24 lats, which is equal to 420 gramms, or 0,926 lb. The left series, that have cylinder shapes, were measurement units for dry products.

On the floor you can see Hungarian laboratory instruments: flats, retorts, a distillery cap, and a vessel for mineral water. An interesting one is a small, plunging-siphon with a handle, which is regarded to be the forerunner of pipette or dropping tube. The balance, right to the shelve, that has the pyramid shape was used at the *Helping Marry Pharmacy* (*Mosonmagyaróvár*, founded in 1690). As you can see, there are drawers on each of its side beneath the arms, as well as in the middle, designed for storing the weights. The two copper platters with their handles are movable.

The painting above the balance is titled *Mithridates and Maimonides* by an unknown South Italian artist (18th century).

The record presented in the middle right of the shelve is the diploma of a pharmacist, *Franz Mayr*, issued by Johann Jacob Hagel's school, the *Nigrum Ursum* in Vienna, 1775.

The big bronze jar, on right of the floor, has a cover with a lock. It was used for storing acid liquids. On the left of it there are two mortars, a wooden and a bronze one. The glasses were used for storing mineral water. Both of them are from South Germany.

The top right corner of the shelve with the preparated animals: an alligator, a starfish, a sword of a swordfish, and an owl is representing the usual decoration of an alchemist's laboratory.

IV. Medicine in the age of Enlightenment

Enlightenment like any great epoch in the history of ideas could hardly be fixed to an exact date. Especially true it is when speaking about a narrow scope of a branch of science — in our case about medicine. New ideas making gradually their ways in time and space, confronting with old and new critiques often show a long and polarized process. In the aspect of medical history, to divide the 17th century from the beginning of the 18th has no ground.

Great scientists, discoverers realized it again that they had to work for the sake of mankind. Research should not have been made for its own purposes but in order to enlighten people and to banish superstition and beliefs in supernatural forces. Having established their systems on the firm ground of empiricism they accepted those facts that had been justified by experience and common sense. As a consequence they chose observation and experimentation as a base for their scientific work. The different branches of science built on the wide foundations of the scientific revolution secured a horizon for medical theory and subsequently for medical practice.

1. Folk medicine

The age of Enlightenment brought about radical changes in the development of sciences. Intriguingly enough, though these new results were important indeed, they influenced only a few educated people and came to be a common knowledge definitely slowly. Folk medicine is a good example how much old treating methods, which were rooted in religious beliefs, were preserved.

The combination of the beliefs in unknown, mystical forces with practical experiences, based on the observations of daily life, is not only characteristic in the medicine of prehistoric man but remained a typical feature of the uneducated masses as well. Oral tradition performed the connection in handing over both of these components from one generation to the next. The beliefs in supernatural powers appeared under the guises of various religions during the history of mankind. Folk medicine has been rooted in traditions. It has petrified its convictions, contents and practice for centuries.

The so-called votive statuettes are good examples of these ideas. They were placed on the altar of the 'deity' on behalf of the sick in order to seek his remedy. The votive statuettes were later called *offers*. We have presented a series of these offers made in the 18th century together with the wooden moulds (No.13 and 14) that were used for shaping the figures, namely one for a denture, an eye, a hand, a child etc. The offer representing a pig must have been offered at times of epizootics. The statuettes were usually made of gold or silver for the better off and of wax sometimes of wood for the poor. They were usually on sale at parish-feasts.

Next to the double crosses and coins, which were supposed to have protective power against plague, there are special Transylvanian pitchers (No.18) in the show-case. Each of them is decorated with the picture of a saint who may protect against certain diseases (e.g. Saint Rochus, Saint Barbara).

In the show-case various instruments of folk medicine are also placed. A simple extracting forceps (No.8), used by peasants in *Bihar* county (Eastern Hungary), a cataract knife for extraction from *Hajdú* county (No.7), and a feeding cup (No.5) are exhibited. A special one is the carved candle stick, forming the upper female body, from *Győr* county (No.4). It was placed beside the bed of a parturient until the delivery was in progress. Beside the show-case there is a votive picture from Upper-Hungary, the so called *Sasvári Pieta*, surrounded with offers, and sick arms and legs made in the 18th c.

Beside the show-case there is the enlarged photo of an engraving representing Cell (now *Celldömölk*), a miraculous holy place that was rather popular in the 18th century.

2. The development of natural sciences

Talking about the development of medicine and pharmacy in the 18th century we should start with the progress in chemistry. Chemistry, in the modern sense of the word, was born out of the chemical knowledge of the ancients lost in the mists of time. Then came the period of alchemy, the *secret science*, which, according to some scholars, spread away triumphantly from China, or reached Europe directly from Egypt as others suggest. *Iatro-chemistry* i.e. medical chemistry, which was created in the Renaissance and developed parallel with alchemy, came to be more and more prominent. From the middle of the 17th century until the last quarter of

the 18th the so-called *phlogiston theory* dominated chemistry. Phlogiston was supposed to be the material or substance of fire but not fire itself. According to the ideas of *Johann Joachim Becher* (1635–1682) and especially those of *Georg Ernest Stahl* (1660–1734) *'metals were composed of a calx, different for each metal, combined with phlogiston, which was the same in all metals and common to all combustibles. When a metal was calcined in the air, phlogiston was evolved and a calx was left behind.'* Though scientifically unrealistic the experimentation of this theory invented indispensable techniques which contributed to the foundations of modern chemistry.

Parallel to the great political revolutions, which basically re-shaped social systems at the end of the 18th century, a revolution took place in chemistry too. One of its fathers was *Antoine Laurent Lavoisier* (1743–1794). Lavoisier had an excellent education at the *Collège Mazarin* where he studied mathematics, astronomy, chemistry, and botany under eminent lecturers. In 1768 he was nominated *adjoint chimiste* to the *Académie des Sciences.* Son of an *avocat au parlement* (advocat of a court of justice) he also beared public offices and during the French Revolution he was appointed *ferme-general* (farmers-general) and later a *régisseur des poudres* (weight registrar) of the Republic. However, in 1794 he was personally accused by Marat and was executed at the *Place de la Révulotion* with many ex-farmers-generals in May. Lavoisier was, nevertheless, most famous about his scientific achievements in doing away with the phlogiston theory. He impressively interpreted quantitative results which were based on his conviction that no ponderable matter disappears in any chemical change, consequently there was no ground to suppose that anything would evolve in burning. He also considered scales to provide chemistry with an irrefutable mathematical basis. You can see a commemorative medal, made in Paris 1821, in memory of him (No.6).

In front of the diagram (No.4), illustrating the apparatus used by *Joseph Priestly* (1733–1804), the discoverer of oxygen, in his experiments in the production of fixed air (carbon dioxide), a sodawater-siphon is exhibited, which operates on the same principles.

The system of *Carl von Linne* (Linnaeus) (1707–1778), the great Swedish botanist, that divided nature in three theoretical parts, articulated the principles for defining genera and species and to adhere the uniform use of specific names. His introduction of bi-nominal nomenclature was also applied to medicine for designating diseases.

Jean-Baptist de Lamarck (1744–1829), was the first to create a modern theory on the history of development of the living world.

We have presented the following contemporary books in the show-case: The *Genera Plantarum* by *Linne*, published in 1764; The *Elementa Chemiae* by *Boerhaave*, published in 1733; and *Lavoisier's Opuscules Physiques et Chimiques*, published in 1810. The *Magyar Füvész Könyv* (Hungarian Herbarium) is an application of Linne's system (1837).

3. Medical theory and practice in the 18th century

The Dutch *Hermann Boerhaave* (1668–1738) dominated the field both of theory and practice in 18th century medicine. He taught medicine at Leyden University and lectured almost on every subject of this science. He was titled *totius Europae praeceptor*, the tutor of whole Europe. His scientific works came to be textbooks at many European universities and were published at several times. His most important contribution to medicine was the introduction of bedside teaching (i.e. teaching at the patient's beside) and thus clinical medicine became an essential part of medical instruction.

One of *Boerhaave's* pupil was *Albrecht von Haller* (1708–1777), a university professor at Göttingen. He studied at Tübingen, then at Leyden under Boerhaave and *Bernard Siegfried Albinus* (1697–1770), and was graduated in 1728. After visiting London, Oxford and Paris, he went to Basle in 1728 where he began to deal with botany. These cities represent the places, where a would-be physician ought to have visited, though Padua and Montepellier are missing from this list. He began to practise as a physician in Bern in 1730. A great pioneer of physiology he was, but an excellent physician, botanist and poet as well. We have presented his work the *Primae lineae physiologiae* (First Lines of Physiology), published in 1747, in which he first declares and proves that anatomy and physiology cannot be separated from each other. His greatest work the *Elementa physiologiae corporis humani* (The Elements of the Physiology of Human Body), which appeared between 1757 and 1766, had been one of the most famous books of physiological research for almost a century.

Although, *Giovanni Battista Morgagni* (1682–1771) had established his reputation as an accurate anatomist with his *Adversaria anatomica* (1706–1719), his great work, which made pathological anatomy a science the *De sedibus et causis morborum per anatomem indagatis* was brought out only in 1761, when he was eighty years old. A professor of anatomy at the University of Padua, he diverted medicine into new channels of perfection. His important contribution to medicine was the discovery that certain diseases bring about specific lesion in the organs and according to these symptoms the disease itself can be diagnosed. The recognitions of Morgagni contributed to the development of pathological medicine and as a result the possibility of casual treatment could be maintained.

Significantly in Haller's and Morgagni's works their theoretical systems and their practical results are of equal importance.

In the show-case below their portraits there are two table microscopes on wooden stands (No.11) and a small portable microscope with a copper handle. Morgagni is commemorated with a edition of his completed works, an *Opera Omnia* published in 1765.

V. The development of public health in the age of absolutism in Hungary

Public health in early eighteenth century Hungary — especially regarding the number of physicians — by no means can be regarded satisfactory. There were whole counties where even a single physician could not have been found.

In 1723 the royal court began to organize a new administrative system in Hungary. A high body, the *Consilium Locumententiale* (Governing Council), was set up in the same year, located in Buda, which was in charge for a number of public matters. Few years later, in 1738 a permanent public council was established within the body of the *Locumtenentiale.* In comparision to the measures that had been adopted by local authorities until that time the establishment of a central body for public affairs might be regarded rather progressive. Nevertheless these offices did not neutralize the political differences between the Habsburg kings and the estates of Hungary.

Whatever political consequences the new system might have had, it was obviously timely, and essential to make public health an integral part of state administration. The foundations of a more general public health policy, which was to cover the whole country, were indeed laid down.

The aim was a complete re-organization of the administrative matters of all Habsburg territories, including those of the public health. The task in the field of medical education and sanitary matters was to be carried out by *Gerard van Swieten* (1700–1772). Van Swieten, organizer of the first Vienna school of medicine, and medical adviser of *Queen Maria Theresia* (1740–1780) had studied medicine at Leyden under Boerhaave, and graduated there in 1736. He was invited to Vienna by the Queen in 1745.

The *Consilium Locumententiale* passed a decree in 1752, which prescribed that each county should keep an educated physician (*physicus*), whose authority was to cover the whole field of public health including supervision of pharmacies, guilds of surgeons, midwifes, health administration and necessary precautionary measures to be taken against epidemics. This institution became the ancestor of the county or municipal medical officers.

The carefully detailed regulation entitled *Generale Normativum in Re Sanitatis*, which prescribed the required duties of physicians, surgeons, midwifes and pharmacists, was published in 1770. It was written by *József Hodosi Skollanich*, the *physicus* of Pozsony county. Soon afterwards, in 1786, the post of chief medical officer (*regni protomedicus*) was created. He was to be responsible for the training of county physicians, the supervision of their education, and the administration of the hospitals. These improvements in health administration brought a significant improvement in Hungarian public health.

The history of university education in Hungary began in 1367 when the Angevin *King Louis, the Great* (1342–1382) founded a university at Pécs. It was followed

by the University at Old-Buda established by *King Sigismund* (1387–1437) and that of Pozsony founded in 1467 by *Matthias Corvinus* (1458–1490), the magnificent renaissance king. At the universities of Old-Buda and Pozsony medicine was involved in the curricula. From the second half of the 15th century, however, there was no university level medical training in the country and those who wanted to study medicine had to travel abroad. Protestant students were excluded from receiving the title of Doctor of Medicine at the University of Vienna so long as the second half of the 18th century. Subsequently they had to attend the universities of Protestant countries. They appeared in big numbers in Holland and Switzerland and a few even on the British Isles. The major part of these students received grants from Protestant cities and from wealthy aristocrats, but these supports almost always involved the obligation to return and work for the patron after successfully finishing studies.

1. Medical faculty at Nagyszombat, Buda and Pest

The University of the Jesuits at Nagyszombat (today Trnava, Slovakia) was founded by *Cardinal Péter Pázmány* (Archbishop of Esztergom 1617–1637) in 1635. At that time it lacked the medical faculty. The first and unsuccessful proposal to set up a medical faculty at this university came about in the 1723 session of the Parliament.

János Perliczi (1705–1778) submitted the same request a few years later to Queen Maria Theresia (1740–1780) but it was equally turned down.

However, *van Swieten*, the medical reformer of the Empire, was able to persuade the Queen to attach a medical faculty to the Nagyszombat University. The supreme ordinance, which introduced and regulated medical education was issued in November 7 1769. This day became a mile-stone in the history of medical education in Hungary. But Nagyszombat did not remain a seat for this university. Being but a remote city, the Queen found it reasonable to move the university over to Buda Castle in 1777. Then in 1784 *Joseph II* (1780–1790) decided to change its residence again, this time for Pest, where it has been still located. Due to unfavourable circumstances (few patients, little possibilities for autopsies etc) that had obstructed up-to-date medical tuition in Nagyszombat the new location was much more agreeable for the faculty.

The history of the foundation of the Hungarian medical faculty is illustrated in a separate show-case. The coloured engraving of Georg Hoefnagel (1542–1600) represents the episcopal town of Nagyszombat (Tyrnavia in Latin, Trnava in Slovakian) at the end of the 16th century. In the middle of the show-case you can see the medical diploma of István Lumniczer (1747–1806), the first representative of a noted dynasty of Hungarian physicians, which he received in 1777 at the University of Nagyszombat. There is also a miniature with his portrait and a copy of his disser-

tation. Next to the memorial plaques there are a series of books written by several famous physician of these times: *van Swieten, Plenck, Trnka, Haller* and *Csapó.*

Around the show-case there are portraits of other famous physicians who laboured in this country: *Vencel Trnka* (1739–1791), professor at the University of Pest in 1786/87.

Sámuel Pataki (1765–1824), chief medical officer of Transylvania, who was the first to perform small-pox vaccination at Kolozsvár (today Cluj, Romania);

Sámuel Rácz (1744–1806) was a professor of physiology at the University of Pest. He promoted the introduction of Hungarian as academic language in medicine. Previously Latin had been used as the only language of instruction in all higher education. '*Dare to speak in our mother tongue, he hath been the first among us*' — wrote later one of his colleagues. And how *Ferenc Toldy* (1805–1875), 'the father of Hungarian literary history', put it: '*He has developed Hungarian terminology for all medical sciences including pathology, physiology, diagnostics and therapy.*' We have placed one of his university textbook on show, the *Orvosi Praxis* (Medical Practice) published at Buda in 1801.

A remarkable engraving by an unknown master illustrates the visit of *King Francis I* (1792–1836) to the military hospital at Lugos in 1789. This is the only representation of a Hungarian hospital interior from these times, hence it has a special value in medical history.

One of our most beautiful piece in the anatomical collection is a life-size female wax-figure (a *moulage*). It is exhibited together with some other smaller wax models, donated by *King Joseph II* to the Medical Faculty of the Pest University in 1789. The model of the female body was made under the supervision of *Felice Fontana* (1730–1802), the learned abbot and famous leader of the wax-model workshop of the *Pitti Palace* in Florence. Many of the most significant Italian wax-sculptors of the period worked at his institute. Our wax-figure were probably made by *Giuseppe Ferrini* or *Clemente Susini.*

The exposed abdominal and chest cavity of the lying nude figure reveals the inward organs, the nerves and arteries. Though the presentation is fairly naturalistic, and performs excellently its function for teaching, the artist demonstrates at the same time his sculptural skills by grasping every motion of a dying lady.

The other models, which represent various sections of the body, were produced probably in the same workshop. They are exhibited around the show-case referring to the level of university education of the late 18th century Hungary.

2. Medical practice in the 18th century Hungary

An indispensable accessory of medical practice has always been the medical kit or case, containing the instruments of the physician visiting patients, together with the most important medicines for first aid. We have presented the most beutiful one of our collection in the show-case. The Late-Baroque wooden kit is a valuable

piece. The convex lid is a marquetry of fine execution both in the front and on the reverse sides. On its sides there is a gilded handle with curved and spun decoration which can be turned. The casket is divided into several parts. The upper part consists of 31 boxes. In the boxes there are white, ground phials with tulip designs. Below, in a hidden drawer there is some empty place for medical instruments among six cylindric tin jars. The refined grinding of the glasses, the beutiful wooden work and the sensible arrangement lead us to the conslusion that the physician who ordered it must have been keen on his profession.

Beside the kit there is a porcelain medicine container (France, end of the 18th century), a box with the signature of the pharmacy of *Verebély*, a phial made of copper, and couple of scoops. You can see also a health report by *Dr István Ketskeméty* about the situation of public health in the villages around Kecskemét in 1785. One of the most interesting piece in the show-case is a coffee-mill, made by a blacksmith. Next to it, you can see *Kibédi Mátyus István's* (1725–1802) *Ó és Új Diatetica* (Old and New Diatetics) (Pozsony 1792), which is opened at the chapter essaying on coffee.

Hungarian medical literature in the 18th is century certainly divided into educationalist and scientific branches. The first category is illustrated with *János Kömlei's Szükségben segítő könyve* (Book Helping in Need) (1790) (No.11) and *Mihály Nediliczi Váli's Házi-orvos szótárotskája* (Dictionary of the Family Doctor) (1797) (No.9). To the second category belongs Kibédi's afore-mentioned book, and *Mihály Kovács's Az emberi élet meghosszabításának mestersége* (after Hufeland, 1794) (Profession of Extending Human Life) (No.10).

Specially interesting is István Weszprémi's (1723–1799) *Succinta Medicorum Hungariae et Transilvaniae Biographia* (Short Biographies of the Physicians of Hungary and Transylvania) in four volumes, published in Leipzig 1774. This book is considered as the most basic source for Hungarian doctors. Weszprémi was not only an excellent medico-historian, but an inventive doctor as well. In his *Tentamen de inoculanda peste* (London 1755) he wrote about the inoculation against plague.

Csapó József in his *Füves és virágos magyar kert* (Herbal and Floral Hungarian Garden) (1775) essayed about 417 medicinal plants giving their old Hungarian names.

3. Surgical, dental and gynaecological practice

Before the foundation of the medical faculty at the University of Nagyszombat Hungarian surgeons were examined by different surgeon and barber guilds of the country. In this show case we have presented the diplom that founded the Guild of the Pest Surgeons, Barbers and Bath Attendants from 1722. This guild was separated from the Guild of the Buda Surgeons (established in 1703) as an independent

entity. These surgeons carried out the less serious medical treatments: venesections, or scarifications or even tooth extractions.

Rácz Sámuel's work, the *A borbélyi tanításoknak első darabja* (No.20) (First Chapters in Surgical Education) published in 1794, was the first Hungarian textbook on surgery of the medical faculty of Pest. Another interesting document is a fee-schedule of surgical operations (No.20), elaborated by *János Justus Torkos* (1699–1770), Head Physycian of Pozsony. These tariffs were used throughout the 18th century in Western Hungary.

Among the surgical instruments from the 18th century you can see *phlebotomes*, cupping glasses, trocars, *fistulectomical* knifes, trephines and catheters. There is *Delaporte*'s cartoon showing a succesful tooth extraction by a French dentist. Next to it you can see a pair of 18th c. rudimentary dental forceps (No.1) with a complete dentist kit (No.2) from the 19th century.

Gynecological and obstetrical instruments from the 18th century are arrayed in the next show-case. Here, you can see the first survived Hungarian obstetric forceps (No.1). The complete obstetrical kit was made in the *Malliard workshop*, (France) in 1793. In 18th century Hungary obstetrics was usually performed by midwives. Some of them received diplomas from the university, but the vast majority was trained by other midwives. The books in the show-case were edited in order to provide them with a more appropriate medical knowledge. *Károly Mocsi's A bábamesterségnek eleji* (An Introduction into Midwifery) was published in 1784 and *János Seidele's Magyar Bábamesterség* (Hungarian Midwifery) (No.2) in 1777. In the book of *András Lugosi Fodor's Szülést segítő tudomány és mesterség* (Art and Profession for Helping Deliveries) (No.3) (1817) there is a good illustration of an early 19th century Hungarian obstetric chair.

VI. Two centuries in the development of Hungarian faïence apothecary jars

Our exhibition in general tends to offer a strict chronological survey through the theory and practice of medicine and pharmaceutics. We have not followed, however, this principle when displaying pharmacy jars and presenting the history of balneology.

The development of Hungarian pharmacy jars between the 17th and the 19th centuries is presented separately. We have chosen this solution not only for aesthetical reasons but because it represents a homogeneous process and reflects the high quality of Hungarian ceramic art as well.

The earliest relics of Hungarian pottery have been the products of potters from the period of the *Árpád dynasty* (1000–1301) so far. Though these vessels which were made for everyday use were already marked on the bottom, these signs have not been figured out yet.

Clay vessels have been covered with lead glaze from the Middle Ages. Under the reign of *King Matthias Corvinus* (1458–1490) Italian masters from Faenza, working for the royal court, introduced the tin glaze of radiance into Hungary. However, when this technique spread away in the 16th century, it was owing to a Protestant sect, the *Habán* craftsmen, who settled in Hungary after 1545. The origin of this Anabaptist community has yet not been satisfactorily cleared up, but we know that they organized a strictly regulated community of goods. The stations of their wanderings were: North-Italy, France, Switzerland, South-Germany, Upper and Lower Austria, Moravia and arrived in Hungary in 1546/47. Their settlements were located mostly in Transdanubia, the Felvidék (Northern Highland or Upper Hungary) (today Slovakia), and Transylvania. They were diligent and talented craftsmen practicing various trades but best remembered for their contribution to pottery.

A characteristic feature of Habán ceramic art is the use of white tin glaze. From the 17th century they introduced blue glaze and the four special Habán colours as well: yellow, green, cobalt and manganese violet, all fired on high temperature. Despite special individual qualities, their decorating motifs reflected the influence of Italian Renaissance, Turkish, Hungarian, Dutch (esp. of Delft) stylistic trends, as well as those of the local Hungarian, Slovakian and Transylvanian folk-art, which may help us to establish the place of their production. Their wares are often labelled (marked) and generally bear the date of production.

The hanbowl (*lavabo*) forming the shape of a fire-place according to its mark dated from 1648. It can be hung on a wall. Special mention should be made of the hexagonal ointment or balm container with floral decoration, wide orifice and a dolphin-shaped handle. It is marked 1661. The hexagonal medicine bottle made for *Gregorius Genser* represents high artistic values. The medical ewer with a pewter lid and handle dated 1678 is remarkable for the so-called *Vandekyan motif* winding round and round framing the Renaissance floral decoration. The rounded rectangular bottle, bearing the inscription *1672: Jar: Domine*, reveals the characteristic features of the Habán ornamental Renaissance style: the detail of the landscape with onion-shaped dome alternates with floral decoration in ornamental frames on both sides of the flask. The above mentioned vessels vary the four basic Habán colours, except a blue monochrome hexagonal ginger or tea container with pewter-screwild which reveals Far-Eastern influence through the mediation of Delft.

The jumping deer and blue bird were also favourite decorating elements of Habán pottery. We have presented two bottles of this type, dated from 1705 and 1724. The 18th century alcohol container with marble imitating design was produced in Transylvania. Below it there is a jug with the date of 1720. The last pieces of Habán jars are two small bellied drug-pots produced in the manufacture at *Kosolna*, near Nagyszombat (Trnava, Slovakia).

The year 1743 was a turning point in the history of Hungarian faïence production. It marks the date when the *Holics* faïence factory (today Holíč, Slovakia), was established under imperial supervision. Their products reveal French (Strasbourg) and Italian (Castelli) influence. The high artistic quality of their products was due to the workers of Habán origin. The most beautiful pharmacy bottles of

the Holics factory are the prismatic bottles of the Jesuit pharmacy in *Eger*, decorated with the coat of arms of *Bishop István Telekessy*, the founder of the pharmacy (middle 18th century.) There are three more faïence jars and a stone-ware one of later origin in the case, all manufactured in the same factory. The first faïence factory in Buda was established by *Domonkos Kuny* (1754–1822) in 1785. He fabricated pharmacy vessels in great numbers: first faïence and later stone-ware pots. The products of this factory were marked with the letters *Of*, which stand for *Ofen*, (the German name of Buda) and the special labels which had an encircling design of wreath of leaves.

In the third show-case we have presented the products of those faïence and stone-ware factories, that were established in the first half of the 19th century. Due to the lower costs of production, *stone-ware*, the invention of *Josiah Wedgwood* (1730–1795), a British ceramist, soon spread all over in Hungary. A number of stone-ware factories were established: to mention only the biggests: *Körmöcbánya* (Kremnica, Slovakia) in 1800, *Kassa* (Košice, Slovakia) in 1801, *Pápa* in 1802, *Murány* (Muráň, Slovakia), *Igló* (Spišska Nová Ves, Slovakia) in 1812, *Rozsnyó* (Rožňava, Slovakia) in 1810, *Miskolc* in 1832 and *Apátfalva* in 1814, etc. The old faïence factories changed over to the production of stone-ware vessels: the Holics factory already in 1786, the *Tata* factory in 1824 and the *Buda* factory in 1809.

The show-case presents the pharmacy jars of the above mentioned Hungarian factories in order to represent the development of Hungarian industry at the beginning of the 19th century. China-ware (porcelain) invented in 1717 appeared to be rather expensive even at the end of the 18th century, thus only the aristocrats and the royal court could afford it. The attention of the new, wealthy bourgeoisie — including the owners of the pharmacies — was paid to the white-glazed vessels made of opal or milk-glass isnstead, which imitated porcelain but was certainly much cheaper. Hungarian glass works, e.g. that of Körmöcbánya, produced opal glass jars in great numbers. Two beautiful pieces made in the beginning of the 18th century have been exhibited in the case.

VII. Balneology in old Hungary

Similarly to pharmacy jars, balneology is also presented as a separate unit and not within the general chronological order.

Water cure is one of the oldest methods of healing. The Carpathian Basin has a remarkable number of thermal springs and spas so it was always an ideal place for bathing. The country also benefited heavily from its location at the crossroads of the West and East and different types of bathing have been smoothly adopted. The foundations were made by the Romans from the 1st to the 3rd century AD. The fifteen decades of Turkish rule contributed with the introduction of Eastern bathing customs, but even Northern habits, e.g. Scandinavian and Baltic saunas appeared

early in Hungary. One of the earliest example of the latter were found in the excavations of the 14th century royal palace of *Visegrád*. Whereas in most European countries public baths usually had smaller pounds and bathing tubes, in Hungary public baths with big pounds, combined with sweating rooms and showers have been preferred since the Middle Ages. Another Hungarian invention was to couple the so called dry air chamber (a Roman, later Turkish custom) with the sweating room (Russian or Scandinavian type).

Aquincum, the chief city of Roman Pannonia, was famous about its baths all over the Empire. There used to be five baths in the military and six public and private baths in the civil part of the city. One of the military baths beneath the today *Flórián Square* (in *Óbuda*), which was excavated in the times of Queen Maria Theresia, had had an own hospital, where patients were cured with special thermal water. We have illustrated the Roman *balneum* with an etch of *Georg Christoph Kilian* (1709–1781), made in 1767.

According to some records during the period of the *Árpád dynasty* the religious medical orders erected baths next to many of their monasteries. The first public bath in medieval Hungary was founded by *St. Stephen* (1000–1038) in 1007, next to the *xenodochion* (hospital) of *Pécsvárad*. Four nurses and six servants worked there. Another steel plate of Rohbock commemorates the hospital and bath of the Johannita Military Order north to Buda, which had been founded in 1178 and was still in use, by the name of *Császármalmok (Kaisermühler)*, in the 19th century.

The most important builder of Turkish baths in Buda was *Pasha Sokollu Mustapha*, a renegade Hungarian *beglerbei* of the province. He had had the today *Rudas* and *Király* (King) *Baths* built between 1565–1578. According to the Turk *Evlia Czhelebi*, a famous traveller of the 1660s, there were nine *ilijes* (baths) in Buda and further two in Pest in 1663. The Turkish baths are illustrated with an engrave of the *Rudas Bath by Lajos Rohbock* (1857) (No.3.). Mind you, some parts of this bath have been operating for more then three hundred years.

The first book of a Hungarian author on balneology, was published in Basle in 1549. It was the *Hypomnemation, de admirandis Hungariae Aquis* (A Short Review on the Wounderful Waters of Hungary) written by *György Wernher*, a constable of Pozsony city and royal advisor. In the middle of the 16th century *Tamás Jordán* (1539–1585) gave an analysis on the medicinal waters of *Trencsény* (today Trenčín, Slovakia). These first attempts were followed by several works concentrating on the chemical analysis of thermal waters. The most significant ones have been presented in the show-case: *János Torkos Justus* (1699–1770) essayed about *Pöstyén* in 1745, *Voita* published a book about *Szkleno* in 1753. *Lőrinc Stocker's Thermographia Budensis* (1721) was the first detailed guide on the Buda baths. In the following century *András Lugosi Fodor*, head physician of Sáros county, wrote about *Mehida* (1844) and the last exhibited one is by *Bálint Horváth*, titled *A füredi savanyúvíz etc* (The Acid Water of Füred) (1848).

A systematic elaboration began in the 1770s, when Queen Maria Theresia pointed out *Heinrich Johann Crantz* (1722–1799), a professor in medicine at Vienna, to collect data on all the mineral waters of the Habsburg Empire. His book, the

Gesundbrunnen der Österreichischen Monarchia (1777) is a richly illustrated and thoroughly elaborated work. We have placed it in the first show-case, together with the first general book on balneology written in Hungarian by *József Török* (1813–1894). In the next case you can see *Ferenc Nyulas's* (1758–1808) *Az erdélyországi orvosvizeknek bontásáról közönségesen* (The Ordinary Classification of Transylvanian Mineral Waters), which was published in 1800, and remained a classsical authority throughout the 19th century.

From the beginning of the 19th century the health resorts of the Monarchy became more and more fashionable among the Hungarian upper classes, gradually assuming the features of the middle class. The Bohemian glass industry, famous for its refined taste and excellent technique, supplied the visitors with beautiful spa glasses.

In the first show-case we have presented spa glasses mostly of Bohemian origin (*Karlsbad, Marienbad, Rohitsch*), together with Biedermaier glasses manufactured in Transdanubia, and sold in Balatonfüred. There are three groups of glasses. The first were used in the *Felvidék* or Northern Hungary (Slovakia), *Pöstyén, Bártfa, Szliács, Stubnya, Tátrafüred* etc. The second group represents the Transylvanian baths (*Borszék, Előpatak, Mehadia, Visk* etc.). And the glasses in the third group were all hand-made in the *Parád Glass House*.

In 1863 the *Locumtenentia* classified all Hungarian spas according to the curative power of their mineral waters. They ranked several places into the first category including Balatonfüred, Bánk, Bártfa, Bazin, Bikszád, Buziás, Erdőbánya, Harkány, Karschnbach, Lubló, Nagyvárad, Parád, Pöstyén, Szliács, Szinnye-Lipócz, Szobráncz, Tátrafüred, Tarcsa, Trencsén-Teplicz, Vihnye, Visk and six baths of Buda.

Between the two show cases you can see the map of Hungarian mineral waters and spas made for the Budapest Exhibition in 1885 by *Kornel Chyzer* (1836–1909), a physician and balneologist.

The engravings above the glass cases present different baths. Matthias Merian (1593–1650) illustrated mineral water treatment in Langen Schwalbach at the middle of the 17th century. Georg (1542–1600) and his son Jacob Hoefnagel (1575–1630) made the one in 1617 that shows Eger (Erlau); it was one of the illustration in the Hoefnagels' famous album the Civitates orbis terrarum, published in Cologne 1618. We have arrayed a row of coloured lithographs about Szliács. The cartoons by Émile Charles Jacques (1813–1894) on the right illustrates the usual treatment: drinking cure, cold and hot bathing. (The Charivari Lithographs, 1843–44)

VIII. Jenner and smallpox vaccination

One of the most dangerous of all diseases which terrorized human race was undoubtedly smallpox. Statistical data informing us about the speed of its spread are shocking. It was such an everyday disease that a warrant of a London criminal

from 1776 indicated to be a special recognition mark that the wanted man had not been pock-marked.

'Apart from bitter tears no efficacious remedy had been known in Europe' — remarked *Sámuel Váradi* in 1802. It is often suggested, however, that certain forms of variolation was known in China already in the 11th century, e.g. pulverized smallpox crust blown into the healthy child's nose. This practice was then used by merchants of the African slave trade, who tried to preserve the beauty of the captured women.

The method of direct infection by the same virus that attacks human beings was introduced into Europe at the beginning of the 18th century. Though it remained rather dangerous it offered the possibility that by a mild form of the disease a consequent immunity could be probably maintained. In 1713-16 two papers describing a practice widely known at Constantinople were read before the Royal Society in London by two Greek physicians from Venice, by *Emanuele Timoni* and *Giacomo Pylarino* (Giacomo Pilarino di Cefalonia) (1659–1718), but it attracted little attention. Both of these doctors had studied at Padua, travelled and worked thoroughly in the Eastern Mediterranean. The method they communicated, had been developed in particular around the Caspian, probably by Armenians. Timoni published his experiences, acquired in Constantinople, in his *Historia variolarum quae per institutionem excitantur* (Constantinople 1713) and a few years later in Europe: *Tractatus de nova ... variolas per transmutationem excitandi methodo* (Leyden 1721). Pylarino's *Nova et tuta variolae excitandi per transplantationem methodus* appeared in Venice 1715, and was reissued in Nüremberr 1717.

The first data on this type of variolation in Hungary are dated from 1717 when *János Ádám Raymann* (1690–1771), physician of *Eperjes* (today Prešov, Slovakia) *'... inoculated* (his patients) *in a method learned from Greek-Armenian merchants...'*. This very method was perceived in England in 1772 when the Princes were inoculated due to the advice of *Lady Marry Wortley Montagu* (1689–1762), the wife of the British Ambassador to Constantinople. Variolation did not prove to be a practice without any risk. It could not give complete protection, and moreover the patient was exposed to other infections, such as syphilis, which was easily transmitted in the process of variolation.

Eventually it was an Englishman, *Edward Jenner* (1749–1823), pupil of the distinguished Scottish doctor *John Hunter* (1728–1793), who successfully developed a satisfactory and harmless method in the 1770s and 80s. His discovery of vaccination matured slowly in his mind. First, he established that cow-pox vaccine (*variola vaccinae*), taken from infected cows can give protection against smallpox. Then he verified that cow-pox actually included two different forms of disease only one of which protected against small-pox. He further ascertained that the true cow-pox only protected when communicated at a particular stage of the disease. He announced the results of his observations and experiments only in 1798 by publishing his *Inquiry into the Cause and Effects of the Variolae Vaccinae*. He had already written a paper on his discovery to the Royal Society a few years ago, but it met harsh opposition. He wrote two more books on the results of his experiments

(1799 and 1800) and tryed to persuade his opponents about the reliability of vaccination. Despite the critique the *Royal Jennerian Society* was established in London in 1803 for the proper spread of vaccination. However, Jenner's merits were faster recognized in Europe, as it was shown by the honours and memberships of scientific societies given to him.

Vaccination was introduced to Hungary by *Ferenc Bene* (1775–1858) a university professor. In his work written in 1802 he mentioned 43 physicians who had experimented with smallpox vaccination. We have presented his *Elementa politiae medicae* in the case.

Another excellent Hungarian physician of the age, *Mihály Lenhossék* (1773–1858), chief medical officer of the country, urged the introduction of compulsory small-pox vaccination. Though Hungary can be proud of the fact that its physicians were among the firsts to recognize the significance of vaccination and quickly introduced it as a practice, it had not been made compulsory until 1876.

Legislation making vaccination compulsory in other European countr ires was first introduced in Bavaria 1807, Denmark 1810, Sweden 1814, Würtemberg 1818, Prussia 1835, and Austria 1886. Considering that Jenner was a British subject the United Kingdom reacted more slowly enacting about this matter only in 1853, though there were earlier provisions indirectly making it necessary.

We have arranged *Sámuel Váradi's* work, entitled *A tehénhimlő avagy a vaktzina* (Cow-pox or vaccine) and several plaques representing the outstanding personalities of medicine of the age, together with a certificate of small-pox vaccination, dated from 1847, in the show-case. Furthermore, you can see a series of vaccination instruments and a translation of *Jenner's* work, the *Beobachtungen über die Kohpocken* (Observation on Cowpox), published in Hannover in 1800.

IX. Sects in medicine

In the 18th and 19th centuries, during the renewal of scientific thinking and systematization, many of the medical theorist fall victim to quick and unsound generalizations. When trying to assert their rather partial truths to all aspects of medicine, at the turn of the 18th and 19th centuries, it resulted a row of medical sects emerging along different sets of dogmatic, and sometimes false medical principles. Many sects, however, were able to articulate a couple of progressive principles of healing.

The Austrian *Friedrich (Franz) Anton Mesmer* (1734–1814), was one of the typical figures of these people. Mesmer, who was graduated in medicine at Vienna, and was interested in astrology, imagined that the stars exerted an influence on living beings on Earth. He identified this supposed force first with electricity, later with magnetism. Then he supposed that stroking diseased bodies with magnets might effect a cure. His book the *De planetarum influxu* appeared in 1766 and be-

came soon popular. Later he was ordered to leave Vienna because of his séances. He removed to Paris (1778), where again he was stigmatized as a charlatan, and a commission of physicians and members of the Académie des Sciences was set up to investigate the phenomena observed in his séances. The elaborate report drawn up by Benjamin Franklin, R. Baillie and others admitted many of the facts, but contested Mesmer's theory as a whole and attributed the effects to physiological causes. Mesmer was soon denounced as an impostor, left Paris and settled in Switzerland, where he died a couple of years later.

John Brown (1735–1788), a Scottish physician, studied and lectured at Edinburgh may be considered as another inventor of strange ideas. Though he was not a mystic like Mesmer, he also formulated a special theory called the *Brunonian theory* of medicine or theory of excitability, in his *Elementa Medicinae* (1780).

Francois Joseph Victor Broussais (1772–1838), a French physician, who was an assistant professor to the military hospital in the Val-de Grace, developed an entirely original system, called the *vampirism*. He announced his peculiar doctrines on the relation between 'life' and 'stimulus' and on the physiological interdependence and sympathies of the various organs in his *Examen de la doctrine médicale généralement adoptée* (1816).

In the show-case we have exhibited a skull-model by *Joseph Gall* (1758–1828) with his diagram showing the localization of the supposed centres of the mental faculties in the brain. This inventive theory, the *phrenology*, faced with fierce opposition from his colleagues. The cartoon you can see in the show-case refers to these disputes. Nevertheless, Gall could be considered as a forerunner in the localization of various brain functions.

Among the manifold theories the *homoeopathy* of *Fridrich Samuel Hahnemann* (1775–1843) has been one of the survivors. It has followers even today, all over the world. The idea, formulated as *similia similibus curantur* (similar to be treated by similars), found its several followers in 19th century Hungary as well. *Pál Almási Balogh* (1794–1867), the private doctor of *Lajos Kossuth* and *Count István Széchenyi*; *Döme Argenti* (1809–1893) and *Gusztáv Jármay* (1716–1890) a pharmacist from Pest, who had had made homoeopathic pocket medicine cases, were among the more famous. Several series of his medicines are exhibited. Next to the show-case the lines of *Mihály Vörösmarty*, the great Hungarian poet of the 19th century, can be read in praise of *Hahnemann*.

X. Development of pharmacy in Hungary in the first half of the 19th century

Hungarian pharmacies were in unfavourable conditions during the first six decades of the 19th century. The Crown's policy was in many aspects arbitrary and Vienna preferred to carry out the centrally regulated plans and orders on her own.

There were sharp differences between the utilitarian orders and their executions, the satisfaction of the government officials and the '*insufficient number of pharmacies*' reported by doctors to county and national assemblies.

Statistical figures from 1840 list 324 pharmacists, while the number of physicians was 555. Most of these chemists worked in Pest-Buda, which explains why their first association, named simply the *Gremium*, was established there, probably in 1809. The first pharmaceutical journal in Hungarian that represented a good scientific standard, the *Gyógyszerészi Hírlap* (Pharmaceutical Journal), was founded in 1848 by *Ferenc Láng Adolf* (1795–1863) a pharmacist and also a judge of the county court in Nyitra. It was not extraordinary in pre-1848 Hungary, however, that an educated local nobleman had a share in jurisdiction if his reputation was good enough. Next to an issue of this journal you can see the second edition of the *Gyógyszerek árszabása Magyarországon és hozzákapcsolt tartományaihoz alkalmazva* (Medicine Prices in Hungary and Adapted to its Connected Provinces) published in 1843. The first edition was brought out in 1829 by the *Pharmaceutical Association* of Pest-Buda.

On the side-wall of the show-case there are two reliefs representing *Hygieia* — one made of metal, the other of wood. The pharmaceutical instruments and objects exhibited in the case are as follows: a mortar made of serpentine (*ophite*), wooden and bronze mould for casting suppositories, a *densimeter* made of copper and glass, an alchoholmeter, a series of metric liquid measures (*mensura*), weights, carved glass with lid, stochiometric tabulation with sliding caliper.

Beside the window, you can see a valuable piece of work of our collection: a herbal press from the middle 19th century. The Baroque style laboratory scale was made at Szombathely (middle 18th c.). It stands on a twisted, bronze column, on both its equally long arms platters are hanged on a chain. The sophisticatedly ornamented analytic balance has a simple column. Its unknown builder was obviously a master of his craft since the scale is as precise, that it has a feather touch.

Among the typical laboratory instruments of the 19th century pharmacies were the presses. In our exhibition we have presented two special samples: one is a herb-press from the beginning of the 19th century, the other one is a tincture-press dating from the 50s of the 19th century. The latter deserves special attention, since it belonged to the *Saint Bernard Pharmacy* at *Zirc*, founded in 1849. It was used for pressing herbs soaked in alcohol, water and wine. The careful functional execution and the rustic forms makes us to suppose that this wine press was manufactured by a talented village craftsman.

Besides altar pieces ordered by the Catholic Church there were also some rich people who ordered different, valuable goods from the same masters. At the end of the 18th century, when sculptural arts flourished, buyers were not satisfied with merely carved furniture. What they needed were something more artistic, so the goods of a skillful sculptor were broadly required.

The two balances with figural decoration made by an unknown master for the *Lion Pharmacy* at *Gönc*, (founded in 1835), are good examples of this development. The lower parts are dark and contain sets of drawers on their reverse. Small

pillows are placed on the top of them, which form a stand for the *Hygeia and Asclepios* statues, both added later to the balances. Asclepios is represented with his usual attribute, a coiling snake on a stick.

The anatomy of the statue is perfectly accurate, the fine execution of the folds of the toga and the delicate smile of the figure suggests that it was made by an excellent master. The balance itself, which was later added to the figure, is suspended on the back of the statue without aesthetically spoiling it.

XI. Medicine in the first half of the 19th century

The spirit and the scientific results of the Enlightenment did not die out without leaving any trace behind. The revolution of scientific thought effected different branches of medicine. Healing had always been considered a science but it indeed became scientific in the 19th century. There was a rapid development in 19th century medicine, most significantly by elaborating new patho-morphological conceptions, and later in the actiological theories. Without the systematic progress of chemistry and physics, that had been brought forward previously, these medical breakthroughs could not have had solid base.

A quick progression in medical and surgical instruments was another pregnant feature: *Jean Nicolas Corvisart* (1755–1821), a physician of Napoleon made a new translation of *Leopold Auenbrugger's* (1722–1809) unfairly forgotten work on percussion, the *Inventum novum* (A New Invention), originally came out in 1761, and published it under his own name (1808). Corvisart, nevertheless, completed his translation with wide commentaries based on his experiences gained during twenty years of military practice. His efforts were successful and percussion came into a common use. Another Frenchman, *René Theophile Hyacinthe Laennec* (1781–1826) has introduced stethoscope to internal investigations.

This was also the time, when microscope has become a basic instrument of medical laboratories. The introduction of ether as an anaesthetic, the discovery of *general anaesthesia, sterilization* and *haemostasis* opened radically new perspectives to surgery. The influence of eminent physicians of this age was twofold: they not only affected university education, but often promoted the rise of various *medical schools* as well. An ever increasing specialisation has started to accelerate during the last century.

1. Medical activities in Hungary in the reform period

The Hungarian reform period (c. 1825-1848), fighting both for national independence and civil society, carried out new achievements even in medicine. Sur-

prisingly, its first achievement appeared by the renewal of the Hungarian medical language. Politically, the reform movement was probably more patriotic than nationalistic, and the continuous efforts for a wider application of the Hungarian tongue were reasoned by the fact, that the official language (i.e. the language in all forms of higher administration, legislation and academic life) had been Latin till 1844. As you have seen there had already appeared a number of scientific books written in Hungarian, but university education remained predominated by Latin and, since 1784 (the reign of Joseph II), by the German language. The movement for the renewal of the Hungarian tongue began as a counter-effect to the implications of German since the end of the 18th century. The activities of a couple of outstanding scholars and scientists soon made a significant improvement.

Speaking about medicine the first who must be mentioned was undoubtedly *Pál Bugát* (1793–1865). Due to his stubborn effects a detailed Hungarian medical terminology was smoothly created. He worked together on this task with *Ferenc Toldy*, the secretary-general of the *Hungarian Academy of Sciences* (which was founded in 1825). Toldy was a famous man of letters. The *Magyar-Deák és Deák-Magyar Orvosi Szókönyv* (Hungarian-Latin and Latin-Hungarian Medical Dictionary), which came out in 1833 was the result of their efficacious co-operation. Later, in 1843, Bugát published his *Természettudományi Szóhalmaz* (Scientific Thesaurus) which covered 40,000 references including 1,000 new words created by himself, out of which a hundred proved to be viable. His role was also tremendous in launching the *Orvosi Tár* (Medical Magazine), the first medical periodical in Hungarian, in 1831. The journal, in which he aimed to collect common and unusual medical cases (*tár* is for collection) attracted great interest. Later, between 1839–49 the edition was taken over by *Ferenc Flór* (1809–1871) an excellent surgeon. Flór had written his doctoral thesis in Hungarian as early as 1834. In surgery he was the first to use chloroform as a general anaesthetic in Hungary in 1847.

We have arranged the material referring to this period in four show-cases. The first volumes of the *Medical Magazine* and the *Hungarian-Latin and Latin-Hungarian Medical Dictionary* have been displayed here together with a manuscript of a collection of medical words. The famous work of *József Sadler* (1791–1849), who was a physician, pharmacist and botanist, entitled *A magyar plánták szárított gyűjteménye* (A Dried Collection of Hungarian Plants) was published in 1824. In the first lower show-case there are some documents referring to *János Teofil Fabini* (1791–1847), the first professor of *ophtalmology*. You can see his prescription from 1828, his door-plate and some of his notes. The material is completed with two sets of *ophtalmological* instruments, the so called Schuster eye-dropper made of blown glass and anatomical instruments.

The second show-case contains documents about *Ágost Schoepf Mérei's* (1804–1858) scheme of his *Children's Hospital* (1836). Have a look of the interesting, dove-shaped opal glass baby comforter.

You can see portraits, diplomas and other documents in the cases placed on the walls. There is a painting about Teofil János Fabini, a manuscript of his inauguration speech when he was elected as the rector, and his major textbook the *Doctrina*

de morbis oculorum (Pest 1831), used at many univeristies all over in Europe. The other portrait shows *Frigyes Grósz* (1798–1858) another prominent obstetrician, and his German book *Die Augenkrankheiten der grossen ebenen Ungarn, und statistische Übersicht ... etc* (1857), which reports the activities of the Obstetrical Hospital in Nagyvárad (now Oradea in Romania), an institute which was founded by him. This case presents also some reliquia of the 1831 cholera epidemic in Hungary. You can see cartoons, among others, about the protective garments invented for this epidemic, and the report of Mihály Lenhossék, the National Head Physician.

About the end of the 1830s and the beginning of the 40s a big number of scientific organization were organized in Hungary. Among the most important ones, which were related to medicine was *The Royal Association of Budapest Physicians*, established in 1837. This organization wished to concentrate the discordant medical profession into a firm organization and soon became one of the most respected bodies of physicians. It was disorganized during the Communist take-over came in 1947. A loose organization, which objective was to hold scientific congresses each year, was the *Magyar Orvosok és Természetvizsgálók Vándorgyűlése* (Itinerary Congress of Hungarian Physicians and Naturalists), founded at the initiative of *Ferenc Bene* in 1841. Another significant association was the *Természettudományi Társulat* (Natural Science Association), set up in the same year.

2. The Vienna medical schools

Clinical medicine in Vienna was established by two gifted pupils of the famous *Boerhaave* (1668–1738), when two Dutchmen, the afore-mentioned *Gerard van Swieten* (1700–1778) and *Anton de Haën* (1704–1776) were invited to Vienna by Queen Maria Theresia, wife of Emperor Charles of Lotharingia. They with the assistance of *Stoerck, Stoll, Auenbrugger, Frank* and *Boer* set up the first Vienna medical school in the 1740s and raised the level of education in Vienna to those of the best European universities. Quite unexpectedly the supposed development stopped at the end of 18th century, probably owing to the administrative principles and hostile attitude of *Kaiser Franz's* (1792–1835) government toward anything intellectual.

It took forty years till a new progression of clinical medicine could start. For the rise of the second Vienna School the years of 1841 indicates a symbolic date. It happened in this year that a celebrated professor of pathology *Karl Rokitansky* (1804–1878) published his *Handbuch der pathologischen Anatomie*, which was said to had been based on 30,000 post-mortem examinations. He had been made professor of anatomical pathology seven years earlier (1834), but after publishing his outstanding book he came to be the central figure of the Vienna medical circles. Later he advised the government on all routine matters of medical tuition. In 1869 he was appointed President of the *Akademie der Wissentschaften* in Vienna.

You can see his medical diploma issued in 1828 and also his diploma in obstetrics granted in 1831 on display.

Joseph Skoda's (1805–1881) *Abhandlung über Percussion und Auscultation* (Wien 1839) (A Treatise on Percussion and Auscultation) has also been arranged in the show-case. He was the first to combine these two methods of examination and thus provided pathological diagnostics with a firm basis. Skoda, a native of Bohemia, was educated in Vienna, where he stayed on as a professor later on.

The third leading personality of the Second Vienna School was another Czech, *Ferdinand Hebra* (1816–1880) a close friend of *Ignác Semmelweis*. Hebra's interest was focused mainly on *dermatology*. His famous book on skin diseases, the *Diagnostik der Hautkrankheiten* was published in Vienna in 1845. His vast experience on this subject won him a world-wide reputation. Professor Hebra was the first to review *Semmelweis*'s discovery.

Beside this famous triad there were another branch of outstanding physicians among the members of the Second Vienna School. *Joseph Hyrtl* (1811–1849) was born in Hungary. Studied in Prague and Vienna, he was appointed professor of topographical anatomy at Vienna in 1845. His book, the *Handbuch der Topographischen Anatomie*, published in Vienna in 1865, is exhibited in the show-case.

Next to the documents, books and portraits we have arranged a row of commemorate medals about the greatest personalities of the Vienna School.

And above the windows we have arrayed a couple of portraits of the famous afore-mentioned Western European doctors of the early nineteenth century, *Xavier Bichat* (1771–1803), *Jean Nicholas Corvisart* (1755–1826), *Philippe Pinel* (1755–1826), and *René Theophile Hyacinthe Laënnec* (1813–1878), and a drawing of the latter's stethoscope.

The medical tools we have displayed here are collected from surgery and dentistry labs together with some prescriptions of these times. The most interesting ones are as follows: a *lithotriptor*, a *phlebotome*, a *trephine*, a needle holder, and a pair of extracting forceps.

3. Medical relics of the Hungarian War of Independence (1848–1849)

The War of Independence in 1848–49 was an important mile-stone in Hungarian history. Though it was suppressed by Austria and her ally, the Tsarist Russia, many of its achievements survived.

Among the fighters for national independence we find prominent personalities of the emerging medical School of Pest: *János Balassa, Lajos Markusovszky, Sándor Lumniczer, Endre Kovács-Sebestyén, Ágost Schoepf-Mérei, Frigyes Korányi*, and *Ferenc Flór*.

These celebrities of Hungarian medicine were united in their political objectives for national independence and a modern civil society. In medicine they had formed

a firm circle, which had lifted Hungarian medical science and national health organizations to a European standard by the second half of the 19th century.

Medical documents in the show-case and the paintings at the top are all from this two years revolutionary period. You can see a handwritting inventory of the Budapest Surgical Clinic (signed by *Balassa* and *Markusovszky*) (No. 7); the appointment of *János Balassa* to ministerial counsellor signed by *Archduke István*, Palatine of Hungary (No. 1); and the memoranda of *Endre Kovács-Sebestyén: Javaslat az állami közegészségügyi és orvosi ügy rendezésére* (Suggestions for the Promotion of State Public Health Service and Medical Issues), which was published in Pest in 1848 (No. 11).

There are two more interesting documents in the show-case: the appointment of *Dr Albert Grósz* to the post of 'general supervisor physician of hospitals' which has been signed by *General Lázár Mészáros* (1795–1858), Minister of Defence in 1848, and Grósz's military passport. The portrait of Illés Politzer (1825–1907) who had been the director of the Nagyvárad Hospital during the War of Independence was painted by *Antal Simonyi* (1821–1892). You can also see *Politzer's* rosette from the *Academical Legion of Vienna*. The Legion was a revolutionary corps of Vienna students in 1848; some of its members later joined the Hungarian forces.

Vilmos Zlamál (1803–1886), whose portrait and sword is presented here, was an outstanding Hungarian veterinary surgeon in the last century. Zsuzsanna Kossuth (1817–1854), was younger sister of the famous Lajos Kossuth, the leader of the War of Independence and President of the Hungarian Republic. Zsuzsanna Kossuth, was the *National Head Nurse* during the conflict in 1848/49, and she reorganized military sick care employing paid female nurses some five years earlier than *Florence Nightangle* began her efforts in the Crimean War.

The pocket-watch belonged to *Ferenc Babarczi Schwartzer* (1818–1889), who was one of the founders of Hungarian psychiatry. During the War of Independence he served his country under the pseudonym *Ferenc Fekete* as a surgeon major.

The exhibited instruments illustrates mainly military surgery: the *ophtalmological* instruments, the bullet-drawer, a surgical set in tool-case, the bone-drills, the trephines on stands, etc were all comprehensively modern instruments at the middle of the 19th century. The wooden chest with iron battens, though considerably heavy, was still regarded an appropriate staff in mobile field hospitals for storing and transporting medicine and medical instruments.

XII. Semmelweis and the emergence of the medical school of Pest

Despite their exceptional talents and diligence in their profession outstanding Hungarian physicians in the first half of the 19th century (like *Rácz, Bene, Bugát* and *Schoepf-Mérei*) did not form a medical school with a kindred spirit. Several

factors contribute usually to the emergence of a scientific school just like in the case of artisan or literary groups. Medical schools, in particular, need not only have experts with high professional knowledge, common opinions, theories, but excellent organisers, an appropriate institutional background and last but not least a favourable political climate as well.

In Hungary the emergence of the medical school came about a bit romantically. In the 1850s most of the essential factors were given in Pest-Buda for organizing such a circle. Its central figure was János Balassa, an excellent surgeon who had been lecturing at the University of Pest since 1843. His active role in the War of Independence got him into prison during the period of Habsburg oppression. After his release he began to organise young doctors into a circle. With his friends he arranged riding tours outside the city, where they could freely discuss political and medical issues. Ironically they called themselves the *Faculté de medicine á cheval* (i.e. The Riding Medical Faculty). In 1850 *Ignác Semmelweis* joined the circle. Other prominent members were *Lajos Markusovszky, Frigyes Korányi, Sándor Lumniczer and Ignác Hirschler.*

In the 60s Hungarian medicine could boast an array of gifted physicians. Among others there were *Lajos Arányi, Jenő Jendrassik, József Lenhossék, Ferenc Schwartzer, János Wagner* and *Tivadar Margó.*

The significance of the Pest Medical School was that its talented, open-minded and highly educated members raised Hungarian medicine to the bests in contemporary world.

In the followings we give a short summary about the four most important members of the Pest Medical Circle, namely about Balassa, Markusovszky, Lumniczer and Semmelweis.

1. János Balassa

János Balassa (1814–1868) was graduated in surgery at Vienna. Receiving his diploma in 1839 he worked at the Surgical Clinic in Vienna, then in the *Allgemeines Krankenhaus.* He was soon appointed to deputy head physician of the hospital. In the show-case we have presented an authentic copy of a certification signed by *Skoda* which declares that *Balassa* had attended the lectures on percussion and *auscultation* organized by the T.B. department. The other document dated from 24 October 1838 is a permission for Balassa to enter the Pathological Institute. After a longer visit to Western countries he received the post of Professor of Surgery at the University of Pest. During the War of Independence in 1848–49 he was director of the Medical Faculty and the Central Military Hospital. After the capitulation of the Hungarian forces he was sentenced under martial law and sent to prison. After his release in 1851 he could re-occupy his chair at the Pest University. He concentrated on educational matters and introduced modern surgical teaching combined with practice. Among the many inventions he brought into Hungarian

surgery was anaesthetics. He was among the first doctors in Europe to carry out operations under general anaesthetization as early as 1852. He was also deeply engaged in many researches for developing new methods in plastic surgery. We have exhibited his *Képző műtétek* (Plastic Operations), a thoroughly illustrated atlas in the show-case. Another important achievement of his surgery was the elaboration of the conservative method in treating tubercular bones and articular diseases.

He greatly contributed to the renewal of the edition of Hungarian medical scholarship. The former standard journal, the afore-mentioned *Orvosi Tár*, that had been edited by Bugát, unluckily had ceased to appear after 1849. In 1857, together with Lajos Markusovszky, Balassa launched the *Orvosi Hetilap* (Medical Weekly), which has been the main organ for medical articles ever since. Moreover, he took part in the organization of the National Council of Public Health, and became its first president.

We have displayed several other objects which present Balassa's life and career. One of the most unusual is a life size carved wooden hand model of his hand, made by the prominent Hungarian politician *Ferenc Deák* (1803–1876).

Among the other objects you can see here there are hypodermic instruments, artery forceps and hooks, an adjustable rectoscope, a chain-saw and several memorial medals. On the panels we have arranged a row of the various diplomas of Balassa.

2. Lajos Markusovszky

Another outstanding personality of the medical school of Pest was *Lajos Markusovszky* (1815–1893). His objectives had been already anticipated by the title of his thesis: *Az orvos, mint nevelő* (The Physician as Educationalist). He had studied — as many other Hungarian medical students — in Vienna for two years under *Professor Wittmann*. In Vienna he made a lifelong friendship of Ignác F. Semmelweis. In 1847 Markusovszky settled in Pest-Buda and became assistant to *János Balassa* who recognized his excellent qualities. *Markusovszky* had employed ether anaesthesia first to himself and then began to perform operations under ether. Similary to *Balassa*, he was also involved in the War of Independence, and gave lectures to military physicians on surgery. Later Markusovszky carried out a difficult operation on *General Görgey*, the Commander-in-Chief of the Hungarian forces. The General had suffered an extremely serious head injury caused by a shrapnel at Komárom on July 2 1849, but due to the successful treatment and his will power he was able to put himself again in command in less than two weeks time, and started to lead his last campaign on 13 July. Markusovszky accompanied Görgey to exile to Klagenfurt after the capitulation at *Világos* on August 11.

The price of his enthusiasm about the political objectives of the revolution and his active role in its sanitary organizations was the loss of his job. Balassa then employed him as his private assistant. He held private consultations and became the

private doctor of the *Baron Eötvös* and the *Trefort* families. These connections with the influential opposition leaders developed into a close friendship. His wide intellectual ability, manifold talents and excellent qualities in organizing made him an energetic supporter of new ideas. He was the owner and editor of the *Orvosi Hetilap* (Medical Weekly), which was first published on 4 June 1857, and which has been the forum of the Hungarian medical society ever since. His name is also connected with the foundation of the *Magyar Orvosi Könyvkiadó Társulat* (Hungarian Medical Publishing Society), which was set up in 1863. It was also Markusovszky who urged *Semmelweis* to publish his discovery. After the Compromise between Austria and Hungary in 1867, when Baron Eötvös was trusted with the Ministry of Educational Affairs, came Markusovszky's time to put his program into practice. First he had been charged with the medical training and later with all university affairs. After the death of Eötvös in 1871, *Trefort* took over the Ministry and he continued to employ Markusovszky. Markusovszky modernized medical training, set up special university departments in public health and promoted clinical education. He indeed laid down the foundations of the post-graduate and post-doctorate education of physicians.

During the last third of the 19th century he took an active part in elaborating programs for reforming Hungarian national health services. The establishment of the National Public Health Council, and the National Public Health Association were the immediate outcomes of these labours. He also collaborated in writing the Parliamentary proposal of the Public Health Act (1876:XIV). These institutions and the Parliamentary Act altogether provided Hungary with an up-to-date national health service.

Both the show-case and the panel are dedicated to the life and work of *Markusovszky*; they present documents on certain important mile-stones of his career.

Above the large show-case with glass walls there is a picture of the professor of the medical faculty of the University of Pest dated from 1863, a lithography by *József Marastoni* (1834–1895).

In the show-case you can see the following objects: surgical instruments, from 1827; an autopsy report of the St Rochus Hospital signed by Semmelweis and the model of *Semmelweis's* skull, made after the exhumation in 1963.

3. Sándor Lumniczer

Sándor Lumniczer (1821–1892), was another great personality of the Balassa circle, a grandson of *István Lumniczer*, the first representative of a famous dynasty of Hungarian physicians. Sándor Lumniczer studied in Pest and Vienna, and received his M.D. in Pest in 1844. He made another degree in obstetrics at Vienna in 1847. Both diplomas are on show together with the enlarged photograph of *Lumniczer* and his disciples. His thesis, the *Orvossebészi értekezés a képlő sebészetről*

(Physico-surgical Treaty on Plastic Surgery), written in 1844, is an important work in the history of Hungarian plastic surgery.

He also took part in the War of Independence. He was medical-officer-in-chief of a battalion and later promoted to surgeon-major and belonged to the staff of General Görgey. In June 1849 he was appointed head of the Public Health Department of the Ministry of Defense. After the surrender at Világos, he was detailed to work as a male-nurse in the Austrian Imperial Army but luckily, by the intervention of Dr *Böhm*, his former collaegue in Vienna, he could avoid to perform this task. During the so-called Bach-regime, the period of Austrian neo-absolutism in the 1850's, his articles were published in the *Medical Weekly*. He worked for the Hungarian State Railways as a doctor between 1860–1886, then became head of the Surgical Department of the St. Rochus Hospital. In 1872 he had been appointed assistant professor and from 1880 professor at the University of Pest. He also had a leading role in re-organizing public health services. He joined the *Royal Association of Budapest Physicians* and was its president between 1880 and 1886. In 1895 *King Ferenc József* (1849, 1867–1916) honoured his efforts by providing him with a seat in the Upper House of the Parliament.

In the show-case, that commemorates his life and work we have exhibited a golden copy of the so-called *Lumniczer*-forceps which was invented by him. He was given this piece by his former pupils. Next to it, you can see a photograph of him and a plaque made by *Dr Ferenc Hőgyes* (1860–1923) together with some surgical instruments of the period: accessories for suture, *tonsillotome*, Petit's *raspatory* and Leiter's *osteotome*, etc.

4. Ignác Semmelweis

The hard life and world-famous discovery of the greatest Hungarian physician is thoroughly discussed in numerous biographies written either by Hungarian or foreign authors. In this chapter we only deal with his reliquia presented in the exhibition, but you can find an entire chapter on him later.

The copies of the *Land-registers* of the Tabán district (No.1), kept in the *Buda Archives*, prove that the *Semmelweis-family* lived in this building between 1806-1823. You can also see a page of the birth-register of the Tabán Parish Church with the entry of *Ignác Semmelweis's* birth (No. 1).

The mourning-card of his father (No.2), *József Semmelweis*, who died in 1846, has been written in Hungarian. This may be regarded rather exceptional, considering that in this part of the city German used to be the most widely spoken tongue at that time.

A certificate (No.5), signed by Semmelweis in 1847, declares that *Markusovszky* successfully completed the required obstetrical-practice lectures.

You can see the original wedding-report of *Dr Semmelweis* with *Maria Weidenhofer* in 1857 (No.3). There are two photographs of Semmelweis taken in 1861 and

in 1864, and another one (No. 4.) presenting his wife in the early years of their marriage, in 1863. The third photo (No.6.) shows the widow and her family in the 1860s. We have exhibited some of his personal belongings too (No.9): his briefcase, a paper-knife made of walrus-tusk, and a silver box in which he used to store his cuff-links.

In the second show-case we have presented the documents referring to his academic life and scientific activities. You can see a copy of the *Medical Weekly* from 10 January 1858 (No.), in which he first published the early drafts of his discovery about the causes of puerperal fever. There is a facsimile of his letter written to the Hungarian Academy of Sciences in 1860 on show. He donated the original copy of this letter to the University Library, Budapest. And you can also see his major work the *Aetologie der Begriff und die Prophylaxis des Kindbettfiebers*, published in Leipzig in 1861.

There are three copies of the *Offene Briefe an sämmtliche Professoren der Geburtshilfe von Dr. I. Ph. Semmelweis* (Opened Letters to the Assembled Professors of Obstetrics by Dr I. F. Semmelweis), published in 1861 and in 1862. In these pamphlets Semmelweis disputed the ideas of two of his opponents, namely *J. Spaeth* (1823–1896) and *F. W. Scanzani* (1821–1891), who both insisted that puerperal fever had been an epidemic. These bitterly arguing papers attracted the attention of European academical circles.

Coming from a German-speaking family of Buda and studying and making his discovery in Vienna, Semmelweis's national identity has been a disputed issue for long. Here we can produce a good proof of his Hungarian consciousness. Consulting *Eduard Siebold*'s paper on *Kindbettfieber* (Childbedfever), published in 1847 in the *Neue Zeitschrift für Geburtshilfe*, Semmelweis made his notes on the margins in Hungarian. His comment on the bottom of the exhibited copy, saying '*Az egész felfogása tarthatalan*' ('His whole conception is unfounded'), represents Semmelweis's temperament. Moreover, according to his diary he felt upset while reading Siebold. These facts, altogether, enlighten that Semmelweis was thinking in Hungarian even while reading German texts in an excited manner.

Above the show-case there are portraits of some famous gynaecologists of the same period and Semmelweis's *Instructions* written on the prophylaxis of puerperal fever. The third show-case presents a few medical instruments used in these times: tools for cutting dead embryos (i.e. somatomes), *uterodilators, bougies*, forceps and a *pelvimeter*.

Furthermore, you can see a forensic medical report by Semmelweis and *Lajos Arányi* (1812–1887), and the photograph and book of *Tivadar Kézmárszky* (1841–1902), Semmelweis's successor in his chair at the University of Pest. On the panel above the show-case you can see the work-places of Semmelweis and photo-copies of his portraits.

The fourth show-case contains the documents and reliqua that are connected with Semmelweis's death: the bilingual (German-Hungarian) mourning-card was circulated by her widow and the other, the Hungarian one was passed round by her family reporting the death of Mrs. Semmelweis. You can also see the epitaph from

the Schmelz-cemetery, where he first rested and the two solid copper plates, used to be fixed onto his metal coffin, and were found during the exhumation in 1963. In the show-case there are two memorial medals dedicated to Semmelweis made by the József Reményi in 1918 and a copy of his skull.

The Semmelweis section concludes with three quotations which may reveal the essence of his life and work: '*Everything was problematic,* — he wrote in his diary — *everything was unclear, everything was dubious, only the high rate of mortality was an undoubtful reality.*'

The second reads as follows: '*Murder must be stopped and in order to stop it I shall keep guard, and anyone who dare to propagate dangerous doctrines on puerperal fever will find a determined opponent in me.*'

The third quotation was written by the English *Semmelweis Memorial Committee*; it reads as follows: '*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 w o r l d.*'

5. The medical school of Pest and the formation of special disciplines

The *Medical School of Pest,* which raised Hungarian medicine among the bests in Europe, did not lack outstanding figures in the last third of the 19th century either. Its development remained uninterrupted.

The founder of the 'Bókay-dynasty', *János Bókay (sen.)* (1822–1884) renewed pediatrics at the University of Pest. *Jenő Jendrassik* (1824–1891) was the first significant representative of physical medicine. He was responsible for the plans of the Physiological Institute of the University, which was one of the most modern institutes of Europe. *Tivadar Margó* (1816–1896) was professor of zoology and comparative anatomy. He was a distinguished biologist of these times and introduced Darwinism to Hungary.

Frigyes Korányi (1823–1913), a member of the 'Balassa-circle' was an eminent Hungarian internist who won European reputation. After the War of Independence he was expelled not only from Vienna but from Pest as well, hence returned to his native village, Nagykálló. Hungarian medicine could hardly get along without his vast knowledge and international experiences. After his rehabilitation, he became a professor of the University of Pest in 1866. He had preserved his post by 1908 and took a leading role in reforming public health services. He started to fight against tuberculosis and his tremendous efforts opened a new epoch in curing kidney diseases. He was a doctor who stood for progressive and modern ideas which were welcomed by all.

Lajos Arányi (1812–1887) was another remarkable representative of this generation. He furnished the department of pathological anatomy at his own costs. He

was professor of pathological anatomy between 1861 and 1873 but his interests covered a fairly bigger area, including archaeology, museology and the protection of historic monuments as well. Among his contemporaries we can find *János Wagner* (1811–1889), professor of internal medicine, *József Török* (1814–1894), professor of forensic medicine and public health, and *Ignác Hirschler* (1823–1891) the famous optician who had been a private doctor of one of the most excellent Hungarian poet, János Arany (1817–1882) for a long time.

The show-case presents dental and ophtalmological instruments and a few interesting pieces from the spectacle-collection of the museum. Probably one of the most impressive objects of the exhibition is *János Czermák*'s (1828–1873) *laryngoscope*, constructed by him in 1858. Czermák — a Czech by origin — was professor of physiology at the Faculty of Medicine of Pest between 1858 and 1860. The exhibited instruments (the *laryngoscope*, the *auroscopes*, *nasoscopes*, the tongue-spatulas, the *laryngeal* painters, etc.) present the contemporary standard of *otorhinolaryngology* (ORL) in Hungary.

XIII. The microbiological revolution and medicine in Hungary

As a result of the manifold development in medicine scientific specialization has been accelerated from the middle of the 19th century. A spectacular series of breakthroughs were achieved in microbiology. If we summarize the history of these researches, it may breaks down as follows:

1. Discovery of micro-organisms by *Leeuwenhoek* in 1683.
2. Establishment of the doctrine of the germ origin of diseases by *Agostino Bassi* (1771–1856)
3. Denial of the theory of spontaneous generation from the middle of the 17th c. to the 18th c. Began with *Francesco Redi* (1626–1697) *Lazzaro Spallanzani* (1729–1799). And eventually *Louis Pasteur* (1822–1895) came to the conclusion, about 1867, that '*There is no fermentation without micro-organisms and each fermentation is caused by a special germ*'.

Beside the portraits of the outstanding personalities of contemporary medicine: *Pasteur* (1822–1895), *Koch* (1843–1910), *Metchnikoff* (1845–1916), *Hata* (1837–1938), and *Ehrlich* (1854–1915) you can see enlarged copies of the signatures of these eminent scientists. Next, in the two show-cases, we have displayed *József Fodor*'s gown from his honourary degree ceremony at Cambridge in 1891. And in the next window there is a uniform of a chief medical officer from the *Hungarian Honvéd Army* around 1900, with a sword and a kepi of a regiment medical officer.

1. Antiseptic surgery — Lister

Antiseptics are substances used for the prevention of bacterial development. Some are true germicides, capable of destroying the bacteria, whilst others merely inhibit their growth. The antiseptic method in treating wounds was introduced by *Lord Lister*, and was the outcome of Pasteur's theory of putrefaction. However, every antiseptic is more or less toxic and irritating the wounded surface. Hence antisepsis this fundamental revolution in surgery was gradually superseded by the more effective aseptic method, which relies on keeping free from the invasion of bacteria rather than destroying them when present. Antisepsis, nevertheless, certainly remained an indispenable method for modern surgery. The introduction of asepsis was linked with *Semmelweis*.

Lord Lister (1827–1912), who was hailed by his contemporaries as *medicorum facile princeps*, had been educated at University College, London. Later he moved to Scotland and settled first in Edinburgh then in Glasgow, where he was appointed to the chair of surgery. Pasteur had shown that putrefaction, like other fermentations, was due to the microbes growing in the putrescible substance and coming from the air. Lister saw that if putrefaction was caused neither by the spontaneous generation of germs, nor by the oxygen in the air there were some chance of preventing it. He selected chemical agents for experiment. He published his results in his *On a New Method of treating Compound Fracture, Abscess etc.* in Lancet, 1857. A contemporary medical review stated about his discovery that through his work '*... he saved more lives than the number of lifes all the wars of history had thrown away.*'

Lister's antiseptic operations and the instruments (his carbolic spray) are demonstrated in photos and drawings. There is an oil-painting of his portrait made by *Ede Komlóssy* in 1887. His hand-writting is preserved in a letter addressed to *József Fodor*.

Under his portrait there is a stone-ware medical wash-basin with blue decoration standing on a wooden stand and deriving from the end of the 19th century.

2. Public health services in the Austro-Hungarian Dual Monarchy (1867–1918)

National Health Service in Hungary was re-organized after the Compromise in 1867, during the period of the dual monarchy (1867–1918). *Balassa, Markusovszky, Korányi* and *Jendrassik* wrote a memorandum in 1868 in which they set forth the most important measures to be taken. It was followed by the establishment of the National Public Health Council and after detailed preparations by the enactment of the Public Health Act in 1876 (Act XIV: 1876), which was the first Parliamentary Act in Hungary setting public health affairs. Under *Ágost Trefort*

(1817–1888), Minister of Educational Affairs, the surgical school of Kolozsvár was developed into a medical faculty (1872). The former department of the so called 'state medicine' at the Faculty of Medicine of Pest University was divided into two new institutions, the department of forensic medicine and that of public health. The first professor of public health was *József Fodor* (1843–1901) who disproved *Pettenkoffer*'s false soil theory and won international reputation. At his initiative there were a row of posts created in each public school for doctors and teachers of public health.

Ernő Jendrassik (1858–1921) was an excellent representative of internal medicine and neurology. From 1893 he was professor at the university of Pest. His book *Szervi szívbajok kórtana és orvoslása* (Pathology and Therapy of Organic Heart Diseases) was written in 1891.

Countess Vilma Hugonnay (1847–1922) was the first Hungarian female doctor. She was graduated at Zürich and had her diploma nostrificated in Hungary in 1897. She wrote her thesis on obstetrics and the training of midwifes. She was one of the leaders of the Hungarian suffragette movement which started at that time, and wrote exhaustively in support of female education.

Vilmos Tauffer (1851–1934) was professor of the Second Obstetrical and Gynaecological Clinic between 1881 and 1918. He was the first to perform stitching of a cut ureter. He had great achievements in the introduction of up-to-date obstetrical and gynaecological operations in Hungary. He took efforts also to reform midwife training and introduce obstetrical registration.

Endre Hőgyes (1847–1906) was one of the most excellent physician scientists in Hungary. First, he had been professor of patho-physiology at the University of Kolozsvár (today Cluj, Romania) in 1875 and from 1883 until his death he was professor at the Medical Faculty of Budapest. Among his manifold activities was his modification of Pasteur's immunization against rabies. He was also the first to start bacteorological researches in Hungary. Moreover, he had an important role in establishing the Hungarian Pasteur Institute. In his three volume work *Az associált szemmozgások idegmechanizmusáról* (On the nerve mechanism of associated eyemovements), written between 1881 and 1885, he was the first to describe '*the reflex arc of equilibrium sense and its reaction to electric impulse and rotation.*'

Baron Sándor Korányi (1866–1944) followed his father's example and became an excellent internist. From 1908 he had been professor of internal medicine and was considered and internationally reputed as the founder of modern pathology and the physiology of kidneys. On the basis of the reduction of the freezing-point of blood and urine he was first to find a satisfactory method to register the functions of kidneys. His urometrical method, has been still used, though in a slightly modified form. He also had a contribution in describing the essence of renal insufficiency and thus he became one of the founders of functional pathology. His merits as a teacher were also remarkable, teaching generations of students he created a significant school.

Károly Than (1834–1908) was an internationally recognized professor in chemistry. From 1862 he was professor of the Chemical Department at the University of

Budapest and initiated to establish the First Chemical Institute in 1872. In 1895 he founded the *Magyar Chemiai Folyóirat* (Hungarian Chemical Journal). He played an important role in the formation of modern Hungarian chemical terminology. He was editor of the chemical part of the second Hungarian Pharmacopoeia.

The show-case illustrating the works of these persons presents interesting medical instruments and tools and some remarkable medico- and pharmaco-historical documents. There is a letter of *Mihály Táncsics*, a writer and revolutionary of the mid-nineteenth century, written to *Dr József Egei* who had carried out a successful eye operation on him (No. 6).

Furthermore you can see a letter of *Lujza Blaha* the famous singer and actress, to *Lajos Tauffer*; Tauffer took one of the first X-ray photographs in Hungary at the turn of the century, and there is another letter to *Tauffer*, written by Baron Sándor Korányi. Among the books you can find *Károly Than*'s fundamental work, the second Hungarian Pharmacopoeia.

The medical tools and instruments are as follows: a metal kit for midwifes, Endre Hőgyes's experimental instruments for fixing hares and doves, Petz's gastric suturating machine, Than's microscope; a cas-iron pharmacy vessels and a leech-spoon.

The medals that represent outstanding physicians of this period are about *Billroth, Röntgen, Hőgyes, Pettenkoffer, Than, Pasteur, Behring, Baron Korányi* etc.

You can see moreover a plaque of *Professor Rudolf Wirchow* (1821–1902), a famous and influential pathologist of the 19th century. Wirchow contributed to the reform of nineteenth-century medical theory in elaborating the very idea of cellular pathology in 1856. His interpretation about how the cells' pathological transformation can cause diseases is accepted even today. His discoveries promoted the development of histo-pathologic diagnostics. He certainly also had his inadequacies: he had been criticizing Semmelweis's thesis about the reasons of puerperal fever, and later Koch's actiological views too, for quite long. One of Wirchow's most important Hungarian pupil was *Otto Pertik* (1852–1913), who later became professor of pathology at Budapest.

XIV. Medical relics of Japan and the Far East

The progress of medicine in the Far East was isolated from the West until the middle of the 19th century. It had only limited influence on Western medical science through the intermediaries of the Arabs. FarEastern medicine became accessible for Europe as late as the second half of the 19th century.

The foundations of Far Eastern medicine were brought about in ancient China. The authors of the first Chinese medical books, i.e. the *Herbarium Pen Tsao* and the medical *Compendium of Nei Ching* are presented here with their photos. Chinese medicine has always been famous of its accurate observations and deep

traditionalism. One of its basic techniques since Far Eastern antiquity, is *acupuncture* (stylostrixis). The model in the window (China early 20th c.) was an essential tool in training stylostrixis. It shows the places on human body that may be sticked by the end of needles in order kill pain or cure illnesses. Beside it, you can see a needle set (Chine 20th century) that was used to be applied in this process. In Europe, the technique of stylostrixis appeared during only the 19th century and became a fashionable curing method in our times, though acupuncture has fundamental differences to European medical theory.

We have illustrated China's richness in drugs with a couple of jars which were used for storing: a snuff-box made of china, jars, a tea-container (all from the 18th c.), and a bronze drog-case (17th c. age of Ming dynasty); and exhibited the *Materia Medica*. The so called opium-pillow (China, 18th c.), made of china too, presents a high value of applied arts. The opium pipe (Japan, 19th century) refers to the late smoking habits of the Far East. The opium itself had been utilized as a painkiller and also as an ordinary medicine since ancient times, but became known as a drug for Europeans since the 17th c.

By the time of the 6th century Chinese medicine had reached Japan via Korea, where it initiated a fast and independent development. You can see a coloured woodcut in the cabinet, in which, according to the lunatic calendar, the first 10 months of pregnancy has been shown by representing the changing positions of the baby. Next to the calendar there is an advertisement from the turn of the 18-19th centuries of an Ossaka pharmacologist, who offers his products, beside giving advices how to avoid illnesses.

A special product of medical arts and crafts of Japan is the *inro*. This is a medicine case made up for one or more compartments, and since it was carried on belts its form and closing device was determined by the peculiarity of the kimono, i.e. that it has no pocket. Among the motives, decorating the sidepiece of the telescoping compartments, the landscapes and figural representations are the most interesting. The safety string is usually fastened, closed and connected to the belt by an ivory carving called a *netsuke*.

XV. The 'Holy Ghost Pharmacy' of Károly Gömöri from 1813

Károly Gömöri a pharmacist and army captain from Pest, elected freeman of the town, scientist, and lover and supporter of arts was born in Győr in 1779. He had served his licence as assistant chemist in Pozsony and graduated in chemistry at the university of Vienna in 1801. He purchased the third pharmacy of Pest, which had been founded in 1786, the *Holy Ghost Pharmacy* in 1803.

This educated gentleman with a sophisticated taste for arts, was as an assessor of the Improvement Commmission of Pest that organized the building of the Hun-

garian National Museum. Gömöri then commissioned *Mihály Pollack* (1773–1855) the eminent architect of the National Museum to design a pharmacy house for him in Király Street in 1812. The pharmacy was opened in 1813. The manufacture of the designs of this wonderful pharmacy interior, was fulfilled by the cabinet-maker *Márton Rosznágel* of Pest (1783–1857), while the decorative wood carving was made by *Lőrinc Dunaiszky* (1784–1835), a noted sculptor.

The furniture is U-shaped with rectangular outline. Rows of drawers were placed at the bottom, and cabinets at its set-backs. The shelves are opened and fitted with glass doors. The division refers to the style of an architect. The cornice crowning the shelves and mounting the whole furniture, projects with abrupt proportioning. Under the cornice there is a guilded black bull's eye lath-work, which stresses the upper level of the fitting and synthesizing the whole interior. Above the wall cupbords the shelved cabinets are screened with mirror-doors of four joints. The straight line of the furniture is broken by a projection at the axis of the rear wall, with a richly decorated French clock standing between the two columns of its cornice. According to the inscriptions that were found on the drawers during conservation, some great Hungarian politicians and writers — *Sándor Petőfi, Lajos Kossuth, Baron József Eötvös* and *András Wachott* — must have been regular customers of the pharmacy. We wished to emphasize the social meeting place character of the pharmacy by placing a set of furniture with fan-shaped backs around the Empire round table.

The most impressive part of the pharmacy are the decorated wooden reliefs carved by *Lőrinc Dunaiszky*. The subject of the six high reliefs was probably given by *Gömöry* himself, their elaboration, however, does credit to the exquisite artistic ingenuity of *Dunaiszky*. Above the entrance door there is the scene 'Curing', then from left to the right: 'Hygieia', 'Chemistry', 'Pharmacy', 'Asclepios' and 'Medicine' follows. The subject of those, decorating the two longitudinal walls, are related to each other, whereas the two partition walls in the opposite sides make up another theme. The classical restriction of the two mythological compositions (Hygieia and Asclepios) could not give room for the adequate reflection of the artist's independent intellectual world, but the rest, provided him with iconographically less settled subjects, hence did allow to express freely his own artistic ideas. The artist threw away the formal academic pattern and gracefully represented the professional activity instead: the allegorical figures authentically reflect the bourgeois charm of the Bidermeyer. The furniture — after being taken into pieces in 1951 — was transferred to the Semmelweis Museum in 1965.

The 600 wooden, glass, faïence and porcelain vessels of the pharmacy come from different regions of the country, and range over the age between the early 19th century and the first decades of the twentieth. The more prominents are the wooden empire footed jars of Gönc and the Bidermeyer ones of Békéscsaba, the faïence vessels of Miskolc, the Alt-Wien porcelain vessels from the pharmacy of the Order of the Sisters of Mercy at Eger; and other porcelains from the Zsolnay Works at Pécs. Among the glass vessels the opaline glasses of The Snake Pharmacy of Pest and the polished jars of the Sisters of Mercy decorated with pome-

granate for containing powders and liquids are to be mentioned. Some beautiful mortars on the tare table, balances and other equipments complete the pharmacy interior, which is unique in its kind.

XVI. The Semmelweis Memorial Room

The last part of the exhibition is the Semmelweis Memorial Room. The interior evokes the atmosphere of the 1860s. The room has been furnished with original pieces, paintings and the rug of Semmelweis, which were all preserved and donated to the Museum by his family. The style of the room brings us back to Semmelweis's age, it is not homogenous, but represents a transitory period. The Biedermeyer and Neo-Baroque furniture is a symbol of bourgeois welfare and harmony. Semmelweis's Neo-Baroque desk, on which he perhaps wrote his main work the *Aetiology*, stands under the portrait of Balassa painted by *Mihály Kovács* (1818–1892). The two bookcases reveal the Biedermeyer style of the Steindl-workshop in Pest. The simple, strict execution gives way to the predominance of the books. It contains some valuable volumes of the his library: *Cicero, Horace* and *Virgil*'s works in a German-Latin series, and an essay about Democrite written by *Karl Julius Weber*. The bound volumes of contemporary obstetrical journals contains *Semmelweis's* own notes. Another original piece is the angular saloon table on the left. The rest of the furniture had been selected to harmonize with the original pieces.

The portrait of his mother, *Terezia Müller*, and his father, *József Semmelweis*, was painted by an unknown Hungarian artist, probably from Buda. His father was the owner of the grocery store *The White Elephant*, which was located in this house. The portrait of the young *Semmelweis*, at the age of 12, was painted by *Lénárd Landau* (1790–1868). The aquarelle portraits of *Ignác Semmelweis* and his wife *Mária Weidenhofer* in 1857, the year of their wedding, was made by *Ágoston Canzi* (1808–1866), a reputed portrait-painter of the age. Beside the contemporary photographs of Semmelweis, that have come down to us, this painting may be considered as the most authentic Semmelweis portrait. We have exhibited two more painted photographs about his wife from a later date and their daughter, *Antónia*.

The interior is completed with his preserved rug, a Savonnaire with blue background which covers the whole room; the white stove, a contemporary lustre, a silver plate produced in the Buda goldsmith's workshop and the frothy curtains.

In the Semmelweis Memorial Room we say farewell to our visitors. '*The Saviour of Mothers*' had started his career in this building where his remains have returned to. The house he was born and where he has been buried thus became a real place of pilgrimage.

The "Golden Eagle Pharmacy Museum" in Buda Castle. Pharmacy in the Renaissance and in the Baroque

(by Mária Vida)

In the most frequent street of the Castle Hill district of Buda, the first pharmacy of Buda Castle, founded after the liberation from the Turkish rule, in 1687 by Ferenc Bösinger, had been working for more than hundred-and-sixty years (between 1750–1913). Bösinger had been the mayor of Buda several times and nobility was granted to him for his services by King Leopold I.

The pharmacy opened originally in the house that existed till 1900 at the site of the now empty ground at No. 1-2, Dísz tér. Prior to 1696 it moved into the building at No. 6. Dísz tér, under the sign of the '*Golden Unicorn*'. The name was altered to '*Golden Eagle*' by János Hinger in 1740, by that time the pharmacy had moved to the present building of the museum at No. 16, Tárnok Street, probably between 1735-1754. It acquired the right to bear the 'municipal' title, that is why the arms of Buda are displayed on the sign board. In the 20th century it assumed the name '*Municipal Pharmacy*'. From 1701 on, the owner of the building was Peter Strudel, manager of the Vienna Academy of Fine Arts, he might have been the painter of the frescoes. The house was bought from him in 1712 by Lőrinc Stocker town physician, author of the first book on the public baths of Buda; the first editions of his '*Thermographia Budaensis*' is to be seen in Room IV.

The building that houses the pharmacy is a merchant's house from the first half of the 15th century, which together with the neighbouring houses at No. 14 and 16, formed of the shop-street, the 'mercerie' of Buda. To this refers also the 15th century dispensing door retrived on the side of Anna Street. The house had been reconstrucced several times: the courtyard tract was built around 1490, the still existing barrel vaults were built between 1526 and 1541; the blind niche is a remain of the Renaissance, the lamp niche is from the days of Turkish rule. The painted ceiling depicting an alchemist decoration of yellow stars against an ash-blue background was put on the wall about 1500. (A present it can be seen in the alchemist's laboratory in secondary placement.) The Baroque wall-painting of brick-red tone and the scene at the left side of the shop depicting '*Jesus and the bleeding woman*' (probably the work of the landlord, Peter Strudel), are from the early 18th century. In the middle of the 18th century, in place of the neo-Classic, late-Baroque doorframe there used to be a Serbian shop-door, similar to the one in Anna Street, this was blocked up about 1800. As it is shown on a contemporary etching, the windows on the ground-floor of the shop were protected by a pent-roof, and the em-

blem of the pharmacy, the '*Golden Eagle*' decorated the front wall of the first floor just at the corner. The present signboard above the entrance door was made after the original by the goldsmith József Pölöskey. The present neo-Classic facade of the building was made about 1820.

Pharmacy in the Renaissance and in the Baroque

The practice that developed in the 15-18th centuries has primordial importance in the development of pharmacy. Based on this period, the permanent exhibition of the ancient pharmacy thematically consits of two main parts: the first big room show the evocative interior of the apothecary's shop representing drug trade, together with vessels, mortars, as well as the most significant Hungarian and foreign pharmacopeias; the second and third rooms show the preparation of drugs in the 'alchemist's work-shop' with laboratory equipments. In the first room on the left, there is to be seen the unknown Transylvanian painter's work from about 1730, depicting the patron saints of medicine and pharmacy *Cosmas* and *Damian* amidst their healing activity. (The painting was made after an etching by Franz Ambrois Dietel.)

In the vault of the Baroque wall-painting there has been installed the reconstruction of a pharmacy interior including also the original drawers that had belonged to the ancient 'Black Saracen' pharmacy, founded before 1647, and had been preserved in the possession of the Küttel family through centuries long. (After the plans of Mária Vida.) The two red marble lion stand on either side of the counter are from the late 17th century and had belonged to the original interior of the 'Golden Eagle' pharmacy. The 'peasant'-Baroque wooden statue of St. Rochus guarding against the plague was carved by a master of Western Hungary in the second half of the 18th century. On the shelving, there is an 18th-century bronze spiral columned balance in the middle. Ceramic alberelli and syrup jars from Italy and also from Delft, Antwerp and Germany, as well as Hungarian glass and wooden pharmacy vessels are placed on the shelves. An outstanding piece is the large-sized faïence vessel from Antwerp about 1600, with the inscription 'Nuces condita' (candied nuts). In the interior, there is hanging left on the wall a hand-painted journeyman's certificate orned with coloured drawing which depicts also a pharmacy interior (officina), it was granted to Mihály Szénn the Brothers of Mercy in 1791.

The large glass-cases display the most beautiful Italian and Hungarian ceramic, glass and wooden drug jars, mortars, scales, a weight holder, pharmacopoeias, prescriptions, a certificate, etc. From among the Italian vessels of the 16–18th centuries the most remarkable ones are the spouted syrup jar from the workshop of Domenico da Venezia, about 1560–1570, the 17th century waisted albarello to contain the sedative 'Diacodion' (poppy-head syrup), or the Castelli jar from 1702

depicting Saint George the dragon slayer, and finally an 18th century unglazed vessel with the inscription '*Theriaca*'. This nostrum, kept at the place of honour in every pharmacy, was held to be the antidote of all poisons, and actually served as sedative as late as in the 18th century, it was first composed by Andromachus, physician to Emperor Nero, of seventy ingredients of which the most important was opium. The famous 17th century weight holder from Nürnberg, the Renaissance mortar from the Netherlands dated 1648, a Hungarian mortar from the 17th century and an Austrian bronze of 1777 add to the variety of the exhibition. The small picture by a German master depicting '*Christ as an Apothecary*' painted in the second half of the 18th century after A. Ehemann's etching (14x18,5 cm) is placed here, too. There can be seen a Plantini edition of the pharmacopoeia by *Valerius Cordus* (Antwerp, 1580). A rare piece is the licence of 1689 for selling medicinal herbs in Venice and its surroundings, granted to a so-called '*aromatarius*'. The show-case at the entrance contains early relics like the Gothic mortars of various shapes from the 14–15th centuries, a beam and scales from the Árpád age (11–13th c.), a 17th century copy of a Renaissance balance, a 15th century manuscript containing medical and veterinary prescriptions as well as the most widely used antidotarium of the Middle Ages, the *Lumen apotchecarium of Quiricus de Augustus de Toronta*, in a Venice edition from 1517. From among the Habán vessels it is worth to point out the keg containing '*Vinum Cerasorum*' (cherry-stalk wine) from the middle of the 17th century, and the early angular ginger holders; one with a floral pattern from 1661 and a unique blue one of the effect of a Delft ceramic from the second half of the 17th century. *János Dávid Ruland*'s 'pharmacopoeia' and *János Torkos Justus*'s 'taxa' as well as *Pál Danyi*'s manuscript '*Medical advice*' of 1757 count among the valuable documents. The third case presents 18th-century pharmacy vessels from Hungarian manufactures (Holics, Tata, Buda, Somfa and others in Upper Hungary and in Transylvania). The most famous ones are the tetrangular bottle decorated with the coat of arms of *Bishop István Telekessy* made for the pharmacy of the Jesuits at Eger, and the vessel from Holics with the double-headed black eagle decorating the space around the label (cartouche), made for the former Jesuit later '*Black Eagle*' pharmacy at Székesfehérvár. The period is represented by glass and wooden jars from Transylvanian pharmacies as well as by the earliest series of bottles with alchemist signs in their cartouche made for the apothecary's shop to the '*Saracen*' in Pécs, at the end of the 17th century. Beside the 18th-century prescription and signatures, the first pharmacopoeia for Hungary, the '*Pharmacopoeia Austriaco Provincialis*' (Pozsony, 1779), found its place here. The shop is connected to the 'alchemist's laboratory' by a 'service-window' which was built in the second half of the 18th century. (Today the floor level is elevated by 30 cms.) The laboratory rooms has a mystic atmosphere with its instruments from the 17–18th centuries and the reconstructed distiling equipment; the basic laboratory process can be seen there distillation itself, as it was performed with flask, cap and retort. The Renaissance round stove was reconstructed after a woodcut in Brunschweig's *Da nüwe distilier Bouch* (1528). The theme is well illustrated by David Rykaert III's (1612–1661) painting:

The Alchemist, which depicts the 'learned experimenter' and his watching wife with the genuine fine humour of Dutch genre-painting. Important old books were placed into the show-case in the front of the alchemist's workshop: the first known alchemist's, Géber's *Alchimia* (Nürnberg, 1541); *Operum Medicorum* which includes a chapter by *Franciscus Joel* physician-apothecary of Hungarian origin, on the 'making of potable gold' (Rostock, 1629); and one of the works of the father of iatro-chemistry, *Paracelsus* (Strassburg, 1603). The first medical-pharmaceutical book in Hungarian, *Péter Méliusz Juhász's Herbárium* (first edition, Kolozsvár, 1578) was placed here, too, together with its sources, the *Krauterbuchs' of Dioscurides, Lonicerus* and *Matthiolus* (this latter on the large open shelf). There can be seen in addition some minerals, herbs, and preparations from the Paracelsian formulary, the later very popular cantharis included. In the next room to the interior there stands in the corner a red copper distiling eqyuipment and there hangs the unknown German master's work *The Alchemist*, painted on wood. On the large-sized oak-wood fittings and beside there are the instruments used in the actions that precede and succeed distillation: mortars of stone, wood and bronze for contusion; mortars of serpentine for porfirisation; drug cutter for concision; the tincture presser from the St. Bernard pharmacy at Zirc and the waffle-iron. From among the instruments for making different drug forms we may mention the pill-maker 'Signette' from the 18th century and the different spoons for cooking plaster. A precious relic is the 2000-year-old mummy's head of which the famous mummy powder was made. The eighteenth-century mummy-powder box from the 'King' pharmacy at *Nagyszeben* (Sibiu, Romania) gives evidence of its contemporary use (in cases of bleeding, coughs, fevers, falling sickness). Attention is caught by *Stefano A. Ghirardini's* (1696–1756) large picture of 1723, the *Apothecary Nun*, which depicts, as a symbol of pharmacy, a standing Dominican nun surrounded with apothecary jars and instruments.

In the last room of the exhibition, beside the signatures and wrought iron door hinges left from the 'Golden Eagle' pharmacy, there are displayed some relics from apothecary's shops of Buda and Pest, like the serpent badge of the 'Serpent' pharmacy founded in 1784 (Italian work, 17th c.). The three-quarter length portrait-á-deux *Károly Handtel apothecary and his wife* painted by a North-Hungarian master in 1784 has a typically provincial air. Right at the courtyard exit a marble memory of the apothecaries who took part in the Hungarian War of Independence of 1848, by the Pharmacy Unit of the Craftsmen's National Association in 1948.

The Semmelweis Medical Historical Museum, Library and Archives

(by Károly Kapronczay)

The predecessors

The first initiatives for the establishment of a medical historical museum in Hungary were taken in 1905, when the Royal Association of Budapest Physicians invited all doctors and the Hungarian public in general to help with their donations the foundation of such an institute. After a promising start, however, the organization was blocked owing to the recession and financial crisis of Hungary. Though Professor Lajos Nekám tried to renew the plan in 1918, but it was fairly a stillborn idea towards the end of the Great War.

The plan for establishing an independent pharmaceutical historical museum first arose in 1919. This plan faced with similar difficulties as its counterpart and was soon postponed.

In the middle of the 1930s a new schedule was launched at the medical faculty of the Pázmány Péter University of Sciences (Budapest). They planned to adhere the museum for medical and pharmaceutical history to the valuable collections of the university institutes, similarly to the organization of the *Josephinum* in Vienna. The majority of these united collections has survived but were never exhibited. The material that had been collected by the Royal Association of Physycians, on the other hand, remained to be stored in poor conditions.

In Kolozsvár (since the end of World War I Cluj in Romania) the foundation of a pharmaceutical history museum was more successful. In 1887 appeared the first initiatives to collect material refering to the past of this profession, and in 1905 Dr Gyula Orient could arrange the opening-ceremony of the first Hungarian Pharmaceutical Museum. Its more than 1500 pieces collection was organized into 8 departments.

The first pharmaceutical museum in Budapest was eventually founded in 1948. The material of the József Ernyey Pharmaceutical Museum derived from the collections of the Pharmaceutical Institute and those of the Hungarian National Museum. This institute was closed down in 1963 and its material was transferred to the new national museum on medical history, the Semmelweis Museum.

The Semmelweis Museum

The Semmelweis Museum was opened after long preparation works, that have been maintoined during the 1950s, in 1962–63. This museum united the material collected by the Royal Association of Physicians (1905), the collection of the József Ernyey Pharmaceutical Museum (1948) and the material collected by the National Medical Historical Library. In 1964 it was united with the National Medical Historical Library, and in 1972 an archives of medical history was added to it. The Semmelweis Museum, Library and Archives is supported by the government.

The Library

The National Medical Historical Library was founded in 1951, when the six thousand volume collection of the former *Hospital of the Brothers of Mercy* had been taken over. The stock of the Library was significantly enriched in 1952 with the library of the former Royal Association of Budapest Physicians, which had been founded in 1842 by Lajos Stessel and contained more than forty thousand volumes by the time of the taking over. The Library also obtained numerous rarities from the collections of the disbanded orders and from different institutes of the Medical Faculty of the former Pázmány Péter University. In 1964 it was affiliated to the Semmelweis Museum.

At present, the library contains more than 110,000 volumes, 20 thousand periodicals, 10 thousand dissertations and 10 thousand separates. The library collects medical literature, as a rule, up to 1900, but reference books or works on medical history are certainly not under any chronological limitation. Since the libary's interest is focused on old scientific books, there are also a big number of works from many related branches, like alchemy, chemistry, physics, astrology, geography and philosophy. The most important special collection of the Libarary is of medical manuscripts, incunabula, and books from the 16th century. In this collection, which contains about 1,500 items, the works of Hungarian authors printed before 1711 are also included, and the first editions of the works of the most significant Hungarian physicians.

The collection of periodicals also contains rarities, such as full series of some 18th century medical periodicals, and among the dissertations there are long series of medical and pharmaceutical theses from the 16th century.

The Archives

The Archives was established in 1972. It collects the papers of former Hungarian medical and pharmaceutical societies and associations, and also the corre-

spondence and manuscripts of outstanding Hungarian physicians. Its material is about 800 linear metres.

Among the most interesting ones are the papers of the Royal Association of Budapest Physicians, and those of many famous Hungarian doctors, like Lajos Markusovszky, Baron Frigyes Korányi, Countess Vilma Hugonnay, Professor István Haynal etc.

The Archives also has a rich collection of medical diplomas issued at various universities of Europe.

The József Ernyey Library of Pharmaceutical History

The Ernyey Library is located in a former house of a chemist in Pest at Mátyás Square 3. It was János Filó, who opened his apothecary, 'The Saint Christian Pharmacy' in March 5 1882, but it was removed to the Mátyás Square 3 in 1890. The furniture was designed in Neo-Renaissance style by Lajos Vanicsek.

The pharmacy was nationalized in 1950 and was closed down in 1978. Next year the Semmelweis Museum, Library and Archives opened its public library for pharmaceutical history in this building, named the József Ernyey Library.

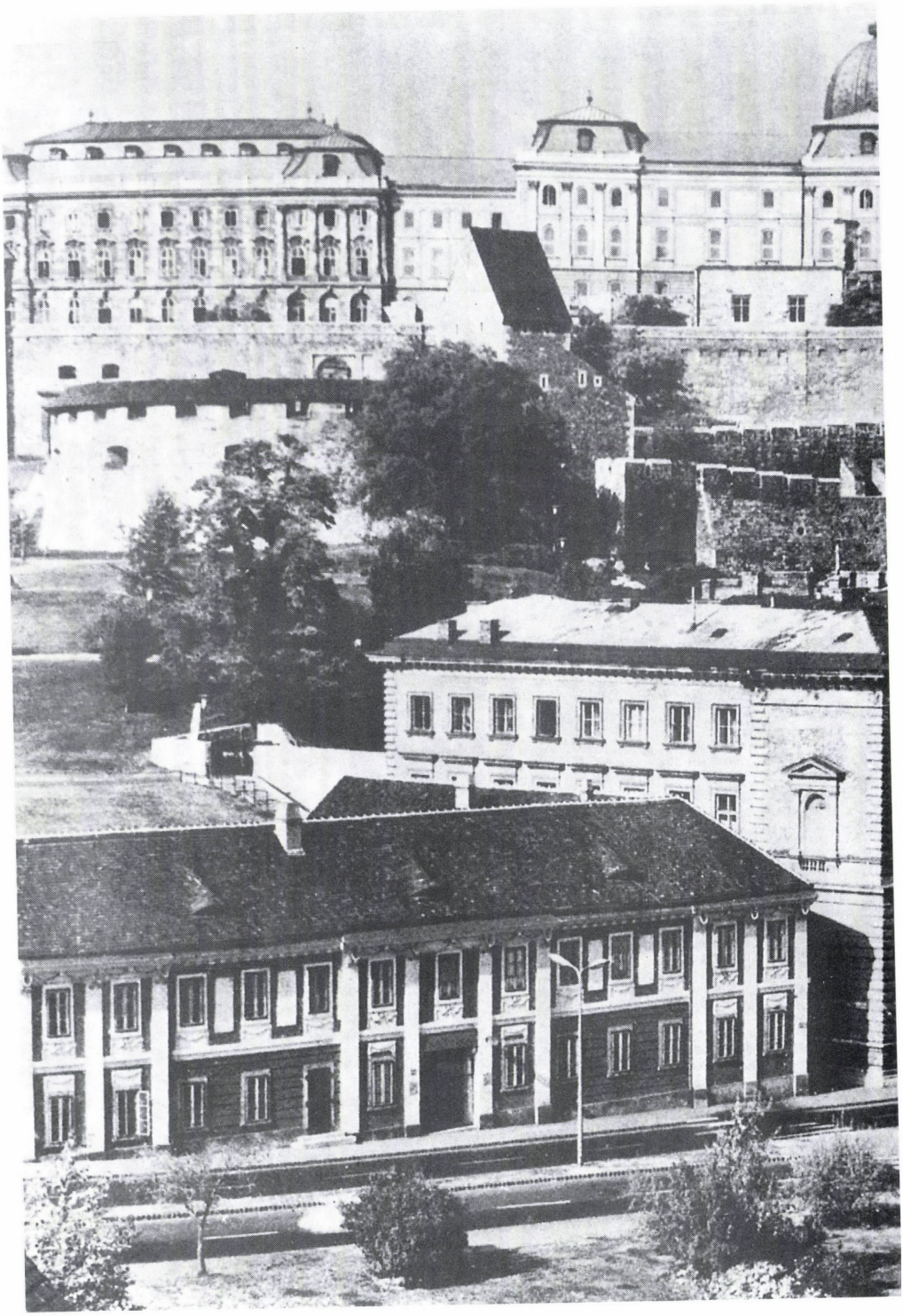
József Ernyey (1874–1945) was a chemist, historian and folklorist. Between 1934–37 he was general director of the National Science Museum in Budapest. As we have mentioned above, he was involved in setting up the first Hungarian pharmaceutical museum in 1908. The books of this institute and those of many pharmaceutical societies formed the base of the collection have been in the possession of the Semmelweis Museum since 1968.

The Ernyey Library collects pharmaceutical books, journals and theses and pharmacopoeias from 1800. The collection of pharmaceutical theses includes more than 2/3 of all such dissertations of Hungarian universities. And another special collection is the Pharmacist Diaries from 1870.

Illustrations

1. The birthplace of Ignác Fülöp Semmelweis in 1900

2. The Semmelweis Memorial Room

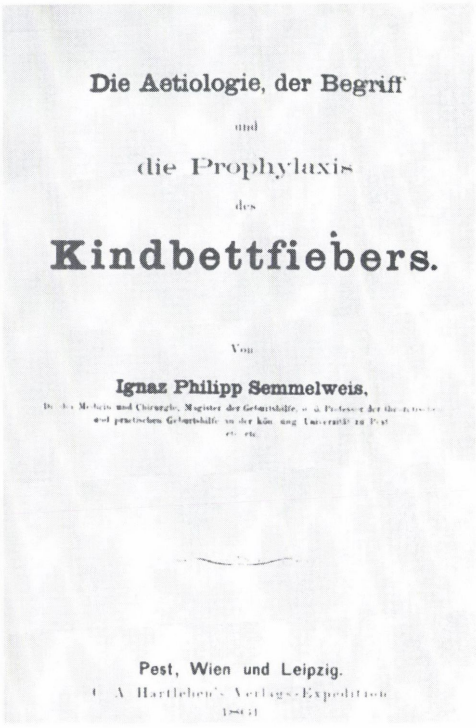


3. The birthplace of Semmelweis

4. Ignác F. Semmelweis by Ágoston Canzi (1857, aquarelle)

5. Maria Weidenhofer by Ágoston Canzi (1857, aquarelle)

6. The young Ignác Semmelweis by Lénárt Landau (1830, oil)


Die Aetiologie, der Begriff

und

die Prophylaxis

des

Kindbettfiebers.

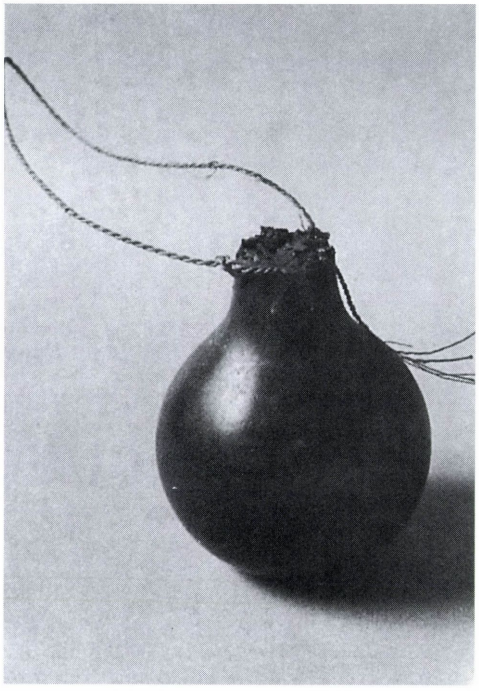
Von

Ignaz Philipp Semmelweis,

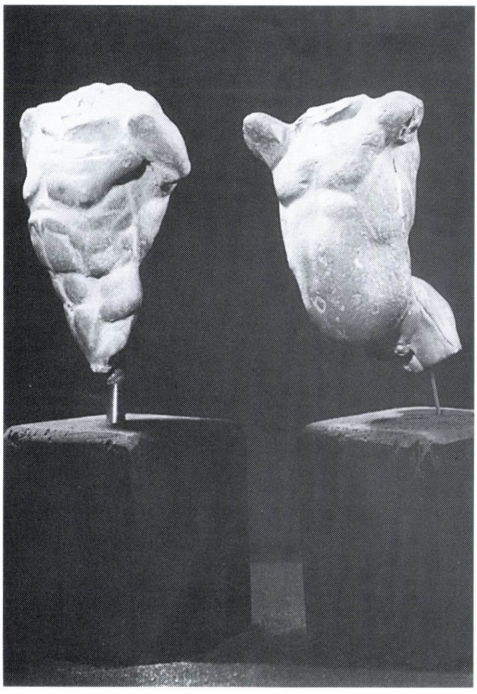
Pest, Wien und Leipzig.

7. Semmelweis's major work on child-bed fever (1861)

8. The last known photograph of I. F. Semmelweis (1864)



9. Scooped pumpkin from Venezuela containing kurare (20th c.)

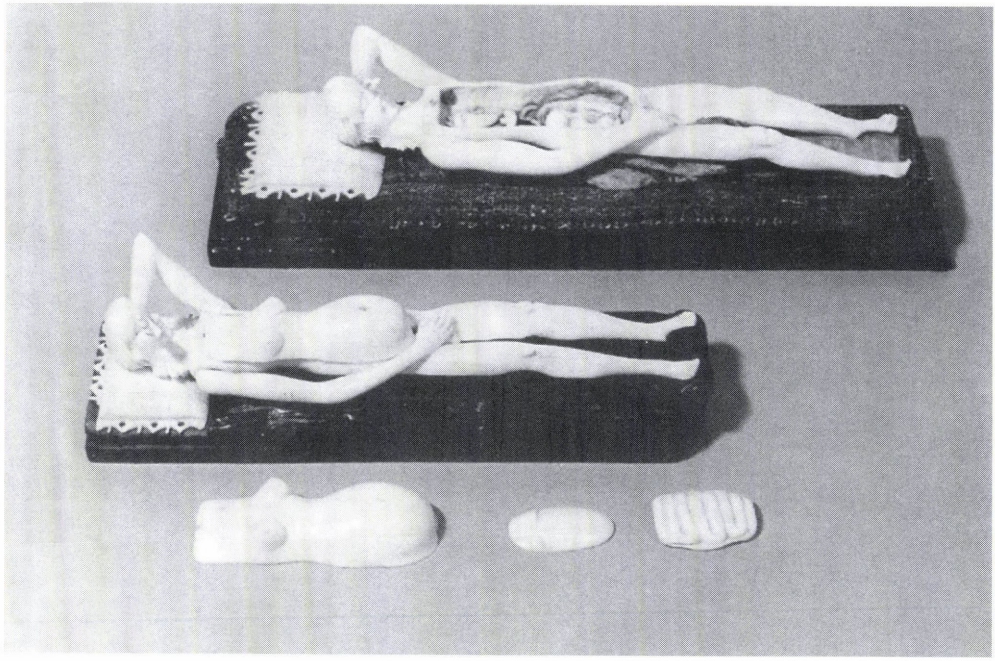


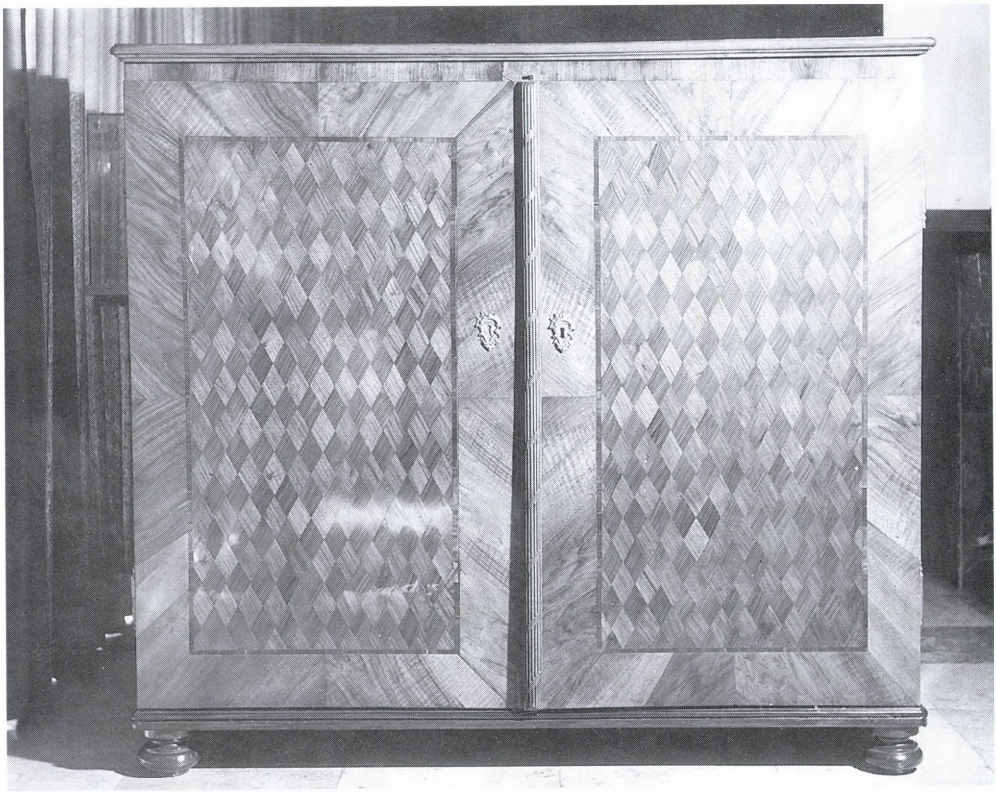
10. Two Hellenistic torsos presenting pathological lesion (Asia Minor 300 AD)

11. Marble mortar (1st-2nd c.) container (2nd-4th c.) and surgical instruments made of bronze (2nd-3rd c.) from Pannonia.

12. Trephined female skull with a silver plate (950 AD)

13. Stephan Zick's workshop (1639-1715): Models of pregnant women. Ivory carving. (Nüremberg)





14. Apothecary cabinet from the *Moor Apotheque*, Pécs (late 18th c.)

15. Netherlander artist: Achilles curing Telephos with the iron filings of his lance (late 17th c.)

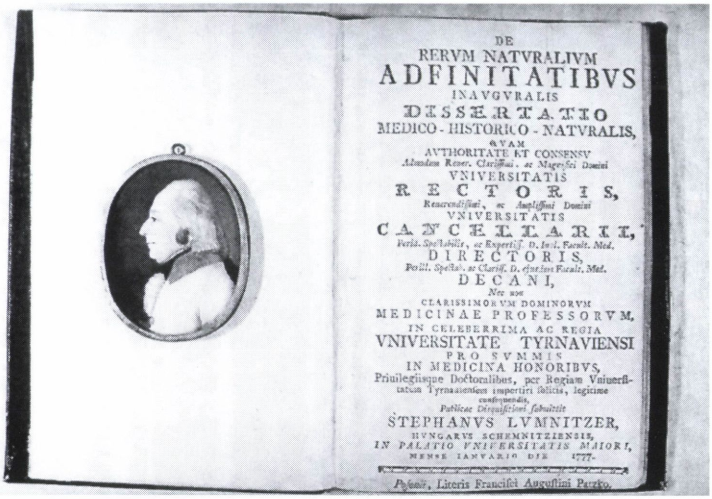
16. Jacob Toorenvliet (1635-1719): The Visit of the Doctor. Oilpainting

17. Italian artist: Mithridates and Maimonides. Oilpainting (17th c.)

18. Netherlander artist: Cranial Operation. Oilpainting (17th c.)

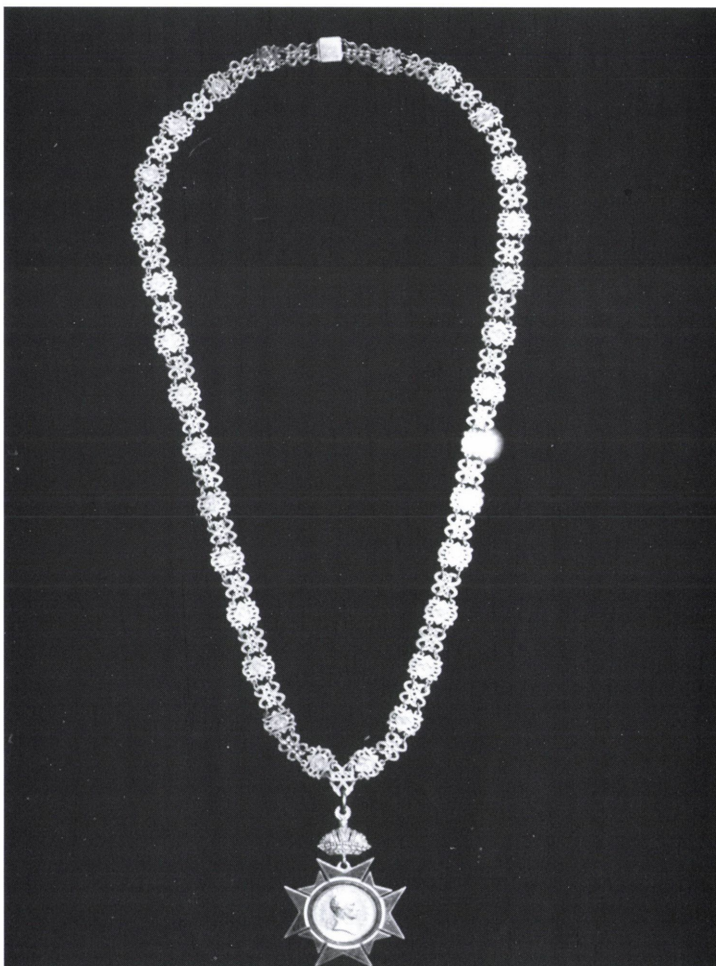
19. Spanish *albareli* from the 17th c.

20. North-Hungarian artist: The Sasvár Pieta with votive figures. Oilpainting (18th c.)

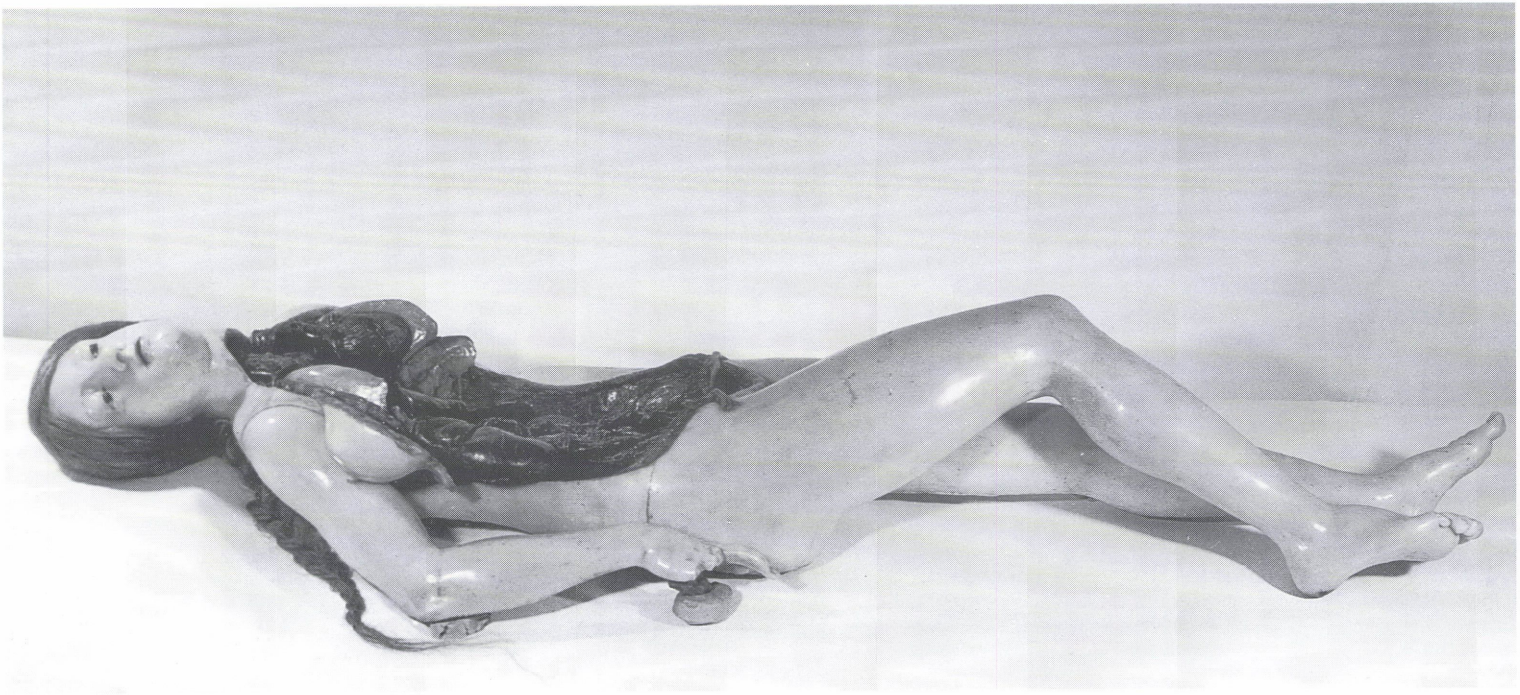


DE
RERVM NATVRALIVM
ADFINITATIBVS
INAVGVRALIS
DISSERTATIO
MEDICO-HISTORICO-NATVRALIS,
QVAM
AVTHORITATE ET CONSENSV
VNIVERSITATIS
RECTORIS,
VNIVERSITATIS
CANCELLARII,
DIRECTORIS,
DECANI,
CLARISSIMORVM DOMINORVM
MEDICINAE PROFESSORVM,
IN CELEBERRIMA AC REGIA
VNIVERSITATE TYRNAVIENSI
PRO SVMMIS
IN MEDICINA HONORIBVS,
Priuilegiisque Doctoralibus, per Regiam Vniuersitatem Tyrnauiensem impertiri solitis, legitime consequendis,
STEPHANVS LVMNITZER,
HVNGARVS SCHEMNITZIENSIS,
IN PALATIO VNIVERSITATIS MAIORI,
MENSE IANVARIO DIE 1777.
Posonii, Literis Francisci Augustini Patzko.

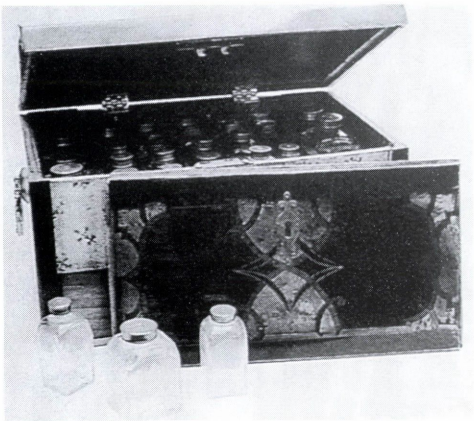
21. István Lumniczer (1747-1806) Head Physician of Pozsony (Bratislava) and his M.D. thesis (Nagyszombat 1717)



22. The insignia of the Dean of the Medical Faculty of the University of Pest. A present by King Ferenc I in 1819



23. Felice Fontana's workshop: *Venus Anatomica*
Wax-moulage. (Florence 1785)



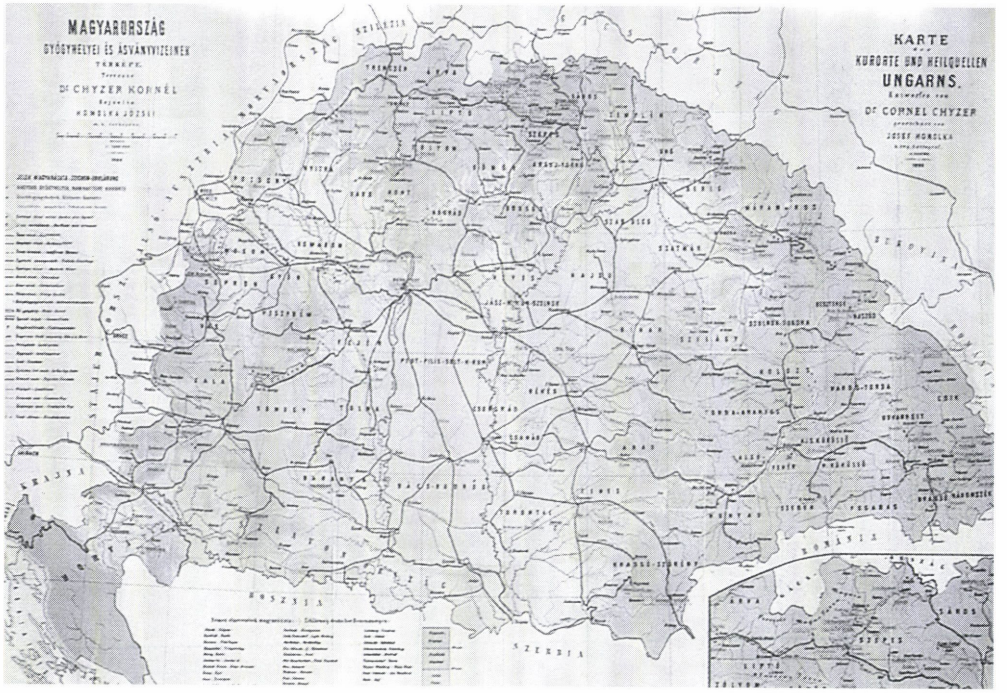
24. Physician's travelling kit (Hungary late 18th c.)

25. Faïence apothecary jars (Tata middle 18th c.)

26. Obstetrical kit (France late 18th c.)

27. Faïence apothecary jars from Domokos Kuny's workshop (Buda 1800)

28. The map of thermal and medical spas of Hungary (1886)



29. C. Rahl: Edward Jenner (1749-1823)
Litography

30. J. Lántz: Ferenc Bene (1775-1858)
Litography

31. F.J. Lieder: Mihály Lenhossék
(1773-1840). Litography

32. A Hungarian edition of Friedrich
Samuel Hahnemann' major work
(1775-1843) with a homeopathic kit

33. The lecturing staff of the Medical Faculty at the Vienna University

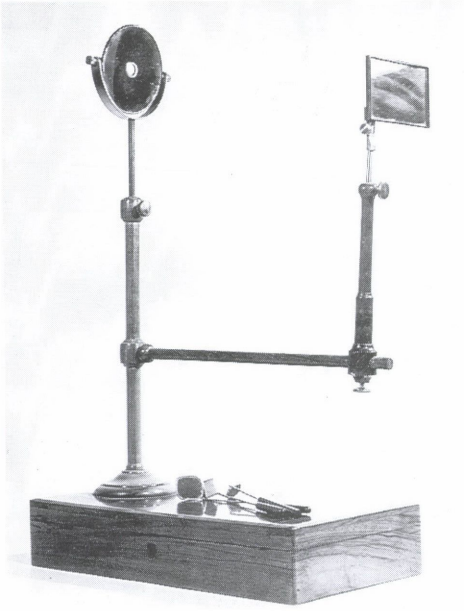
34. József Marastoni: The professors of the Medical Faculty of the Pest University. Litography. (*Standing from left to right:* János Diescher, János Wágner, Lajos Arányi, Ignác F. Semmelweis, Gáspár Lippay, József Lenhossék, Jenő Jendrássik, Döme Nedelkó, Ferenc Linzbauer, Dávid Wachtel, Tamás Stockinger. *Sitting:* Vilmos Zlamál, Ignác Sauer, János N. Rupp, János Balassa)

35. Zsuzsa Kossuth (1817-1854) as National Head Nurse in 1849. Pencil drawing

36. Sándor Lumniczer (1821-1892). Photogpraph (1880s)

37. Laryngoscopic investigation by János Czermák (1828-1873). An illustration from his Kehlkopfspiegel und seine Verweltung für Physiologie und Medicin (Leipzig 1863)

38. Czermak's laryngoscop for self-investigation



39. Lajos Markusovszky (1815-1893) Photograph (1880s)

40. János Balassa (1814-1868) Photograph (early 1860s)

41. János Bókai (1822-1884) paediatrist

42. Baron Frigyes Korányi (1827-1913). Photograph (early 1900s)

43. Countess Vilma Hugonnai (1874-1922) the first Hungarian female physician. Photograph (1880s)

44. József Fodor (1843-1901) Photograph (1880s)

46. Vilmos Tauffer (1851-1934) Photograph (from the turn of the century)

45. Baron Sándor Korányi (1866-1844) Medal by Zs. Kisfaludy-Stróbl (1926)

47. The interior of the *Holy Ghost Pharmacy* (Pest 1813)

48. Balance with Hygieia status from the *Lion Pharmacy*, Gönc (founded in 1825)

49. The 'Alchemist's workshop' of the *Golden Eagle Pharmacy Museum*

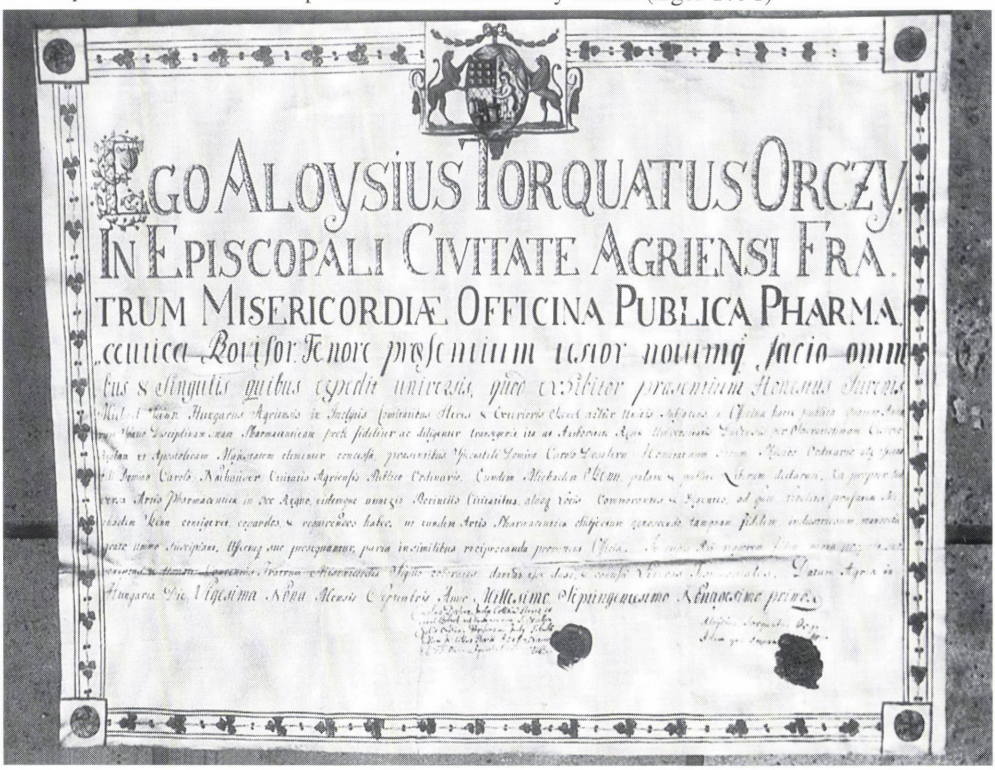
50. Renaissance mortar and scoops (Netherland 1648)

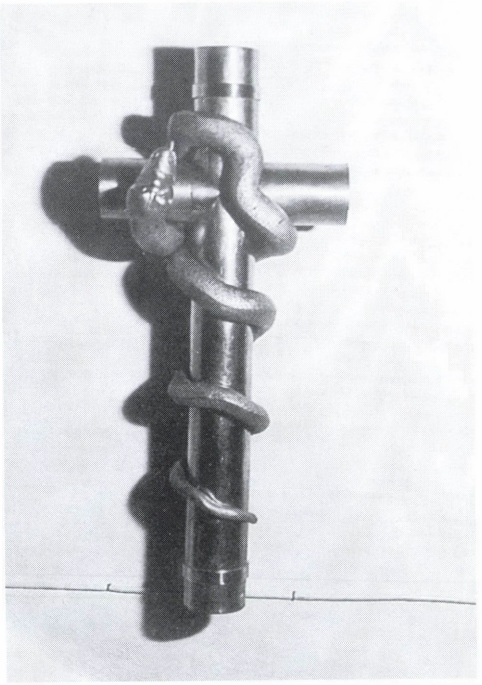
51. Interior of the *Moor Pharmacy* (Kőszeg 18th c.) (reconstruction) and two red-marble lions from the ancient 'Golden Eagle' Pharmacy (18th c.)

52. Head of a mummy with a box of mummy powder

53. Painted commode of the *Slage Apotheque,* Pest (1784)

54. Diploma of an assistant-pharmacist from Mihály Szénn (Eger 1791)





55. Sign of the *Snake Pharmacy,* Pest (Haly 17th c.)

56. Habán tub with the wording *Vinum Cerasorum* (middle 17th c.)

57. Apothecary jars from the *Jesuit Apotheque* (Eger) with the shield of Bishop István Telekessy (Holics 1743)

58. Italian apothecary jars (early 16th c.)

59. Habán rose-water container or *lavabo* (1648)

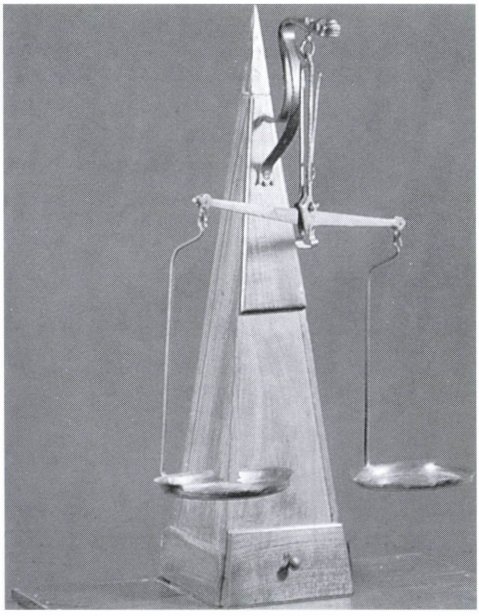
60. Weight-container (Nüremberg 17th c.)

61. Pharmacy-kit (South-Tirol 1730–1740)

62. The Jessenius Commemorative Medal (silver, 1618)

63. Microscope (18th c.) and Matthiolus's Kreuterbuch (Frankofort 1611)

64. Balance from the *Helping Mary Pharmacy,* Mosonmagyaróvár (founded in 1690)



SEMMELWEIS MUSEUM, LIBRARY AND ARCHIVES OF MEDICAL HISTORY