200 YEARS OF VETERINARY EDUCATION IN HUNGARY

1787—1987

200 YEARS OF VETERINARY EDUCATION IN HUNGARY

CONTENTS

Appendix

AUTHORS' INDEX

Scrutinized by

Kardeván, A.
Kovács, F.
Szent-Iványi, T.
Várnagy, L.

Grammatically supervised by

Kecskés, Ilona

Editor

Holló, F.

Foreword

The present and the future are equally rooted in the past. Knowledge of the past helps orientation in the present and enhances progression in the future.

The spirit of retrospection has pervaded the preparations for the worthy celebration of the bicentenary of this University, Hungary's sole institution of veterinary higher learning for two centuries. The publications issued on the occasion of the anniversary take account of the past events through which the school has risen to its present standing, and outline its development schemes until the forthcoming turn of the century.

This volume presents a historical review of the two-century development of veterinary education in Hungary, from the very beginnings to date. The first century had been an epoch of struggles for the school and for the social appreciation of the profession. The second century has witnessed the unprecedented progression of natural sciences, which has lead in the veterinary field to the extension of professional responsibilities for ensuring the healthy conditions of animal production to related fields of public health and protection of the environment.

There is no question that, on the long road covered, the pioneers of veterinary education in this country had volunteered to follow the rougher tracks; posterity keeps their memory alive in grateful recognition of their imperishable merits.

The foundation of the school dates back to the epoch of enlightenment in Europe. The enlightened sovereign, Joseph the Second, Emperor of Austria and "uncrowned king" of Hungary, had recognized that in Hungary, "a predominantly livestock farming country", the control of epizootics and the development of public health equally demanded the introduction of higher education in veterinary science. In his decree issued on the 12th November 1786, Joseph the Second ordered the foundation of a Veterinary Department in the Faculty of Medicine, University of Pest, and nominated *Sándor Tolnay* for its Head. Conform to the sovereign's highest decision, the Royal Governor-General's Council issued directions for the establishment of the Veterinary

Department in its *order no. 4748*, on the *6th February 1787*. This was the date of the beginning of veterinary education in Hungary.

Remembering the beginnings causes the present members of the profession to cast thoughts back in the remote past, in which the springlets of veterinary science had welled up all over Europe, to unite later, in an ever widening bed, to a powerful branch of the mainstream of sciences.

A guide to retrospection is furnished by the introductory historical chapter of this volume. It describes, on the basis of original documents, all important events of the school's history, in which essentially three main epochs deserve special consideration. The *first epoch*, which had lasted roughly a century, had covered the development of a professional school which, although founded under the auspices of a university, had failed, for various reasons, to come up to university standards. The *second epoch*, which commenced around the turn of the century, was a period of speedy development to an institution of higher learning. This development was pushed by an outstanding generation of veterinary professors, first and foremost by *Ferenc Hutÿra*, who with his wisdom, diplomacy, never failing energy and steadfastness surmounted the difficulties which had hampered the rise of the school, and was able to lay down the foundations of a Veterinary College. During the more than thirty years while *Ferenc Hutÿra* held the office of Rector, the Budapest veterinary school attained the standards of the best higher schools of Europe. It was among the first European colleges vested with the authority of awarding the title of doctor. The *third epoch* of the school's history began after World War II; in the last four decades, the development of the school has been inseparable from the economic and social development of the country. Government subsidies, which had been scanty in the past, have been lavishly bestowed in these last decades, along with an unprecedented moral backing. In 1962, the former Veterinary College was promoted to university standing by decision of the Presidential Council of the Hungarian People's Republic.

The volume presents the list of the principals of the school in a chronological order, and detailed information on its structure and current training schemes, adjusted to the newest trends of Hungary's rapidly developing agriculture and animal production.

Postgraduate veterinary training, too, has long been the responsibility of this University. Undergraduate and postgraduate training have been integrated into one process of learning, in which postgraduate instruction is superimposed on basic professional training. A variety of postgraduate courses has been offered to satisfy newer demands on the profession.

Research has been traditionally conducted in this school, and the research achievements have always been utilized for raising the standards of professional education. The University of Veterinary Science has served, for many years, as the coordinator of veterinary research on a country scale. One chapter of

this volume describes the research projects which are in charge of the University, and informs about the main research achievements of the last five years.

Another chapter informs about the relations of the University to other — home and foreign — institutions. In the home orbit, connections have been traditionally close to the national veterinary service, to agricultural production enterprises, and to institutions in charge of related sciences. A mutually advantageous collaboration has been maintained in matters of education and science on the one hand, and animal production and health preservation on the other.

Connections to sister institutions abroad also have been traditional ever since the foundation of this school. While, however, in the past, international relations had been largely based on single personal contacts, in the recent decades they have been extended to interchange programmes involving a wider circle of scientists and students.

Separate chapters of this volume deal with the history and evolvement of the departments and disciplines, and with the scientists contributing to the development of veterinary education in their chosen fields. It has been a particularity of this school that two or more disciplines and/or subjects have been in charge of one Department.

The Appendix to this volume presents lists of the honorary doctors of the University of Veterinary Science and its legal predecessors, of Members of the Hungarian Academy of Sciences and holders of state prizes among the school's teachers, and of awardees of the József Marek Memorial Medal founded by the University for presentation as an award of merit.

All chapters of this volume were contributed by specialists of the topics covered. It is the readers's competence rather than ours to judge how far the contributors have succeeded in presenting historical events and other information of importance and interest. The history of the school has been inseparable from that of the country from the beginning, It follows that, for circumstances beyond their control, the Great Old Men of this veterinary school could never achieve all improvements they wanted, but had always done everything in their power. That is our promise, too, for the future.

Budapest, May 1986

Prof. Dr. Dr. mpx. h. c. F. Kovács

Rector
Member, Hung. Acad. Sci.

HISTORY OF THE BUDAPEST VETERINARY SCHOOL

D. Karasszon, Titular Professor

Introduction

The purpose of this brief historical survey beyond the historical facts, is to present the development of veterinary education and science during the 200-year history of the Budapest veterinary school. For this reason, this review will highlight several facts not mentioned in the late Professor Kotlán's excellent volume on Hungarian veterinary history (1941), whereas only brief mention will be given of others described in great detail in that volume. Appreciation of Kotlán's historical work as a source-book has been documented by references to it wherever it seemed appropriate in this review. The different historical approach in this review has focussed on the causes of the events recorded in history rather than on the events themselves, more precisely on the socio-economic interactions and/or epizootiological situations leading to progression in veterinary education and science. In other words, the main objective of the historian has been the elucidation of the social and economic importance of the veterinary profession.

The traditional intimate interrelationships between veterinary education, science and practice account for classification of the material presented to conform to the periods of public history. The disproportional lengths of Parts I—V of this review reflect that, with the gradual differentiation of the school into an increasing number of departments, each of these units entered its own course of history, to which the school itself provided only the framework.

PART I

Department and Institute of Veterinary Medicine of the Medical Faculty, University in Pest (1787–1851)

By the end of the eighteenth century, lay veterinarians had completely lost control over the devastating epizootics which not infrequently had spread from one continent to the other and caused periodically heavy losses to Hungarian livestock. In Europe, above all the unprecedented losses due to rinderpest had prompted the governments to seek new approaches to the control of

contagious animal diseases. Losses from contagious diseases had contributed to the foundation of veterinary schools in many countries of Europe during the late eighteenth century. The world's first veterinary school had been founded by Bourgelat in Lyon, France, on the 13th February 1762, and already the next year, in 1763, three students, L. Scotti, E. Mengmann and J. Heller, were sent to Lyon to train in Bourgelat's school by order of Maria Theresia, Empress of Austria and Queen of Hungary. After completing the course, the three graduates established a "veterinary teaching hospital" in Vienna in 1767, which, however, failed to satisfy the higher authorities, above all Baron van Swieten, chief medical officer of the empire, who wanted to place the cause of higher veterinary education in the hands of medical doctors rather than of farriers trained in the mere rudiments of veterinary art. Van Swieten's candidate for veterinary professorship was the physician Pál Adami (1739–1814), a Hungarian by birth, who was called upon to study the diseases of animals. In the meantime another medical doctor, the field surgeon Wolstein (1783—1820), was sent by the Imperial Defense Council to Lyon for veterinary studies. Adami submitted his recommendations for establishing a veterinary training course under the auspices of the Medical Faculty of the University of Vienna in 1771; van Swieten, who died in 1772, did not live to see the opening of the course in 1775, in charge of P. Adami, whom the Empress appointed Professor of Veterinary Medicine on the 4th March 1775. In the same year, another veterinary course was started by imperial order in Transylvania, in the Institute of Medical Surgery of Kolozsvár, with Péter Fuhrmann as its first teacher. On his return from the Lyon school, Wolstein had been sent to Hungary to start the third veterinary school of the empire in Óbuda (at present a district of Budapest), but, dissatisfied with the conditions in that town, Wolstein insisted on opening his school in Vienna. With the consent of the co-regent, the later emperor Joseph the Second, Wolstein's veterinary school was founded in Vienna in 1778, and Scotti's "horse hospital" was dissolved next year. After the death of the Empress Maria Theresia (on the 29th November 1780), Professor Adami, who had been removed from his office in the meantime, and J. W. Schmid, shoesmith and former teacher of farriery in Scotti's school, applied to the Imperial Chancellery and Defense Council for permission to open a veterinary school in Óbuda. The Emperor Joseph the Second on the 14th September 1782 ordered a veterinary institute to be established under the auspices of the Medical Faculty (then a school of physicians and medical surgeons) of the University of Pest. The affiliation of veterinary training with the medical school was justified by the circumstance that an imperial order issued in 1770 had referred the control of epizootics to the competence of the chief medical officers of the counties (or towns), and the execution of the pertinent duties had presupposed the training of the students of medicine and surgery in the diseases of animals, mainly in epizootiology. The Council of the University of Pest en-

trusted the Viennese Professor Wolstein with elaborating the plans of the new institution. Wolstein came to Pest for a local survey in 1783, and submitted a detailed draft in due course, but finding competent teacher had remained a problem until the Emperor on May 26, 1784 nominated Sándor Tolnay candidate for a degree in medicine, and student of Wolstein's veterinary school in Vienna, to head the future veterinary department. Another two years elapsed until S. Tolnay completed the veterinary course, and His Majesty's Highest Decision was issued on the 12th December 1786 as follows:

"Sr. Majestät haben nach dem Beyspiel der Übrigen hohen Schullen in den deutschen Erblanden auch bei der Universität zu Pest die Errichtung eines Lehr Stuhls der Vieh Arzney Kunde zu bewilligen, und für denselben Alexander Tolnay als Lehrer mit den Systemisierten Gehalt von jährl. 600 fl. zu ernennen geruhet. Ihm Universitäts Magistrat wird dieser Höchste Entschluss mit dem hiemit angezeigt, dass die nähere Bestimmung zur Errichtung dieses Lehr-Faches nachfolgen wird. Ofen den 12-ten December 1786." ("His Majesty has agreed that as exemplified by other high schools of the German hereditary provinces a chair of veterinary medicine also be founded in the University of Pest and has approved the nomination of Alexander Tolnay to that Chair—as teacher with a fixed salary of 600 florins per annum. This Highest Decision is made known to the Academic Board of the University with the note that a next decision on the institution of that discipline will follow. Buda, 12th December 1786").

In accordance with that Highest Decision issued on the 6th February 1787 was the governmental decree No. 4748, which laid down instructions for the institution of the veterinary school and can therefore be regarded as the "*decree of foundation*" *of veterinary education in Hungary*. It reads as follows (translated from German):

"The following disposition is referred to the Academic Board about the foundation of a Veterinary Department, in the High School which had already been made known to the Academic Board.

The topics of the lectures shall be confined to pestilences and diseases of cattle, sheep, horses and pigs; the course shall be started in February and shall end in July; three lectures shall be held every week, always for one hour. The Academic Board after an interview with the teacher Tolnay, shall decide the lessons themselves, the place and the housing of one or another animal species, altogether during the entire (veterinary) course, with regard to the long school vacation, and shall report the proceedings to the Royal Governor-General of Hungary.

Concerning the required instruments, equipment and books, a list of these shall be sent to the Academic Board in the Enclosure and the sum required to procure these, Fl 549, kr 58, shall be remitted, and made payable at the banking house of Pest.

The making of the instruments shall be ordered in Vienna, but the equipments and books procured locally when available considering the transport costs, at the prices quoted in the list, and care should be taken to enter each item into a written inventory.

The Academic Board is obliged to advise the veterinary teacher Tolnay about this decision and particulars of the establishment of the department, and to take further measures to implement these instructions; the report to be submitted on the proceedings should also inform the day of arrival of the above mentioned teacher Tolnay in the High School. Issued by the Royal Governor-General's Office in Buda on the 6th February 1797."

A copy of that decree, provided with the signature of the emperor, was handed to the newly appointed veterinary Professor Sándor Tolnay in Vienna, on the 2nd January 1787; he arrived in Pest next month to take up his office, and he was ceremonially installed on the 18th June 1787. On that occasion he gave an inauguration lecture "*On the importance and benefits of veterinary medicine, especially for Hungary*" ("Von der Nothwendigkeit und dem Nutzen der Thierarzney, besonders für Ungarn").

Thenceforth all professional activities of Professor Tolnay were centered on the development of the Budapest veterinary school.

Professor Tolnay's struggles to maintain the veterinary department and institute

The original assignment of S. Tolnay had been to give lectures in epizootiology to students of medicine and surgery. From 1788, he volunteered to tutor private students in veterinary science and advocated the establishment of an *independent veterinary institute* to promote the cause of higher veterinary education. In his application submitted to the Royal Governor-General of Hungary on the 26th March 1789, he suggested that the future institute be housed in a detached building with several rooms and place for a stable subdivided into compartments enabling the segregated housing of various animal species. Tolnay's application was approved, and the institute was established. It moved several times, until, in 1795, it was located in a farmstead (Kenedits or Kenedics farmstead) near the outskirts of Pest, in which it functioned for the next 32 years, until 1827.

However, with the veterinary institute just founded, the trends of centralization increasingly pursued in the Habsburg monarchy also permeated the contemporary education policy; influential circles in the Vienna court, headed by the renegade Hungarian aristocrat Count M. Pálffy, suggested for the sovereign in 1795 to dissolve the veterinary school of Pest and instead, from public donations to extend the Vienna veterinary school to a college with boarding house, for instruction in veterinary science of students recruited from all

parts and provinces of the empire. The Academic Board of the University of Pest, however, rejected the proposal unanimously with reference to the opinions of the professors S. Tolnay and L. Mitterpacher.

Tolnay's efforts for higher veterinary education and an independent course in veterinary science

Since newer regulations pertaining to the medical service *(Supplementum Normativi Sanitatis* de anno 1773) had reinforced the responsibility of medical officers to control epizootics, the main purpose of the newly started veterinary course had necessarily been the introduction of the students of medicine and surgery to epizootiology and to contemporary measures of infectious animal disease control. The early history of veterinary education in this country is, therefore, included with the contemporary documents of medical and surgical education.

The curriculum and examination schedule of the University of Pest, issued in 1774, prescribed a *course in medical science* and *a course in surgery*. The *course in medical science* extended over five years, and only graduates of the course in arts were admitted to it. Candidates having passed three final examinations and defended their thesis, were granted the "Doctor of Medicine" degree. The two years' *course in surgery* was held for students released from apprenticeship by the Guild of Surgeons; they were trained in fundamental anatomy, medicine, surgical techniques, forensic medicine, use of surgical instruments and wound dressing, and after passing an examination they received a "Master of Surgery" certificate.

The Emperor Joseph the Second in 1786 ordered, in the period of Tolnay's appointment, the reorganization of the system of higher medical education by amalgamation of the courses in medicine and surgery into one training programme, to provide the students with adequate knowledge in all branches of medical science. The period of the amalgamated course was reduced to four years, which covered training in the following prescribed subjects: anatomy, chemistry, botany, natural history, general and special surgery, physiology with anatomy, use of surgical instruments, wound dressing, obstetrics, general pathology and pharmacology, practicals in clinical medicine, surgery and obstetrics, and visiting hospitals. To this curriculum *the course in "veterinary art"* was added starting *from the academic year* 1786/87.

A two-year course in minor surgery was nevertheless still offered to satisfy the requirements of the "lower classes" in urban and rural areas; admitted to that course were all barber's apprentices who could read and write, and testify a three-year apprenticeship in a barber's shop. *The students of that minor surgery course also had to attend the lectures of Professor Tolnay during the second year of training.*

The public education law *(ratio educationis publicae)* issued in 1806 had again extended university training in medicine and surgery to five years, but had not changed the conditions of the two-year minor surgery course *(chirurgia minor seu biennalis)*.

At the time when S. Tolnay had begun lecturing in epizootiology, the students of medicine and surgery numbered 60—80. Tolnay gave his first lectures to that audience in June 1787, and soon recognised that the medical officers engaged in municipal services would not be able to cope with all duties of the animal health service. He therefore started a four-month course in veterinary medicine and art for animal breeders. The Lord Lieutenant of the County Pest delegated 21 literate farmers to that course which, although "non-official" *(sub titulo privati)*, also took in volunteers from other counties of Hungary, by consent of the Governor-General's Council.

The decree no. 22 733, issued by that council on the 5th July 1787, prescribed possession of a certificate of examination in veterinary medicine as a prerequisite for admission of medical graduates to municipal service in towns or counties.

Owing to misinterpretation of that regulation, Tolnay issued on his own accord special diplomas for the medical graduates. This practice was stopped, but simultaneously it was ordered that all counties had to send two medical officers to Tolnay's veterinary course.

In 1793, Tolnay submitted to the competent higher authorities his recommendations on the expansion of the veterinary curriculum to the pathology and therapy of all animal diseases. He also recommended that apart from medical doctors and masters of surgery, farriers, husbandmen and grooms be admitted to veterinary training. He suggested a one-term course in epizootiology for students of medicine and surgery, and a two-year course for the shoesmiths, farmers and grooms. However, his recommendations were not approved at that time.

Tolnay, being in need of assistance in the execution of his duties, submitted applications to this end which were repeatedly refused on account of being "exaggerated". Finally the surgeon Ignác Pohl, who had attended the veterinary course in Vienna, was nominated assistant to Tolnay. After Pohl's death in 1803, Péter Stulfa (1769–1823) rendered excellent assistance for six years, until an invitation to a Chair in the Medical Faculty made him return to his original profession. Tolnay's third assistant, Román Brunkala (1782–1821), master of surgery, had served as teacher of animal health in the Georgicon agricultural school of Keszthely, and as chief veterinarian of the Keszthely estate, before his invitation to the Veterinary Department.

It should be mentioned in this context that, above all with regard to military interests, the authorities finally approved Tolnay's recommendations for the veterinary training of farriers, who had, for centuries, traditionally

served as horse-doctors without any adequate knowledge of veterinary medicine. A governmental decree issued on the 25th September 1799, ordered farriers to attend Tolnay's veterinary course, and a next decree, dated February 10, 1801, even prescribed holding a certificate of attendance of this course as a prerequisite of licensing on the territory of the Hungarian kingdom. On Tolnay's recommendation, a shoesmith's shop *(officina ferraria)* was erected in the farmstead housing of the veterinary institute, and the farrier Ferenc Hangl (Hangel) was engaged to serve as tutor in farriery *(magister fabrorum)*.

As already noted, Tolnay's epizootiological course for students of medicine and surgery covered exclusively the study of the then most important infectious diseases of animals (rinderpest, anthrax, foot-and-mouth disease, liver fluke disease) and of measures for their control. A survey of Tolnay's library permits an insight into the source of his knowledge and into contemporary conceptions on epizootiology. The library comprised the books of Ramazzine, Lancisi, Camper, Tode, Adami and others, which, by retrospective judgement, presented the then most advanced knowledge of infectious diseases. At the same time Wolstein, Tolnay's tutor in veterinary medicine in Vienna, had been a follower of the vitalist (anti-contagionist) school, and had as such attributed the origin of epizootics exclusively to environmental factors, rejecting the role of transmission in their spread. Tolnay was forced to follow Wolstein's conception, and not to deviate from the officially agreed training programme. Nevertheless, another book in Tolnay's possession, a "Treatise on medical policy" ("Discurs über medizinische Polizey"), published in 1786 by Zakariás Theofil Huszty, chief medical officer of the town Pozsony, reflects a different orientation. That book, published two years before the similar manual "System einer vollständigen medizinischen Polizey", Vienna, 1788) of the Austrian author J. P. Frank, represents the first world scale volume of written instructions for the control of epidemics and epizootics.

Tolnay's course in farriery and veterinary art *("pro fabris ferrariis agasonibus equatorium praefectis oeconomibus aliisque zooiatrium praxis exercentibus"* or *"cursus hippiatriae")* covered, according to the contemporary curriculum *("ordo praelectionum")* instruction in the following subjects: external appearance of the horse, dietetics, equine gestation, elements of natural history, bones and organs of the horse, special pathology and therapy, general pathology and therapy, pharmacology, surgical interventions. While Tolnay lectured in Latin for the medical students, he gave the farriery course parallel in Hungarian and German. Among his students instructed in the German vernacular there was one non-Austro-Hungarian citizen: the equerry and stud manager Christoph Koegler of Magdeburg, who received a certificate of examination from Tolnay in 1788.

Tolnay's contributions to the organization and development of the animal health service

The assignment of medical officers to the control of the animal health administration required not only training in epizootiology, but also adequate legal provisions. The originator of the first directions to this end had been S. Tolnay, who had, in addition to his duties in the veterinary school, served as animal health advisor in the Governor-General's Council from the beginning of his professional career. Posterity appreciates him as the *founder of veterinary administration in Hungary*. The intermittent ravages of rinderpest caused Tolnay to elaborate two *directions for the control of cattle plague* issued in 1792; the first of these, No. 40 198, covered 24 paragraphs and was issued first in Hungarian, later also in German, to the administration of all counties for distribution, the second, No. 5677, entitled "Orders to avoid cattle plague", also comprised prescription for therapy. This second circular has gone down in veterinary history for also prescribing *food (meat) hygienic measures*, as follows: " . . . it shall be prohibited to slaughter sickly cattle and to sell their meat: the carcases of those perished shall not be thrown to the dogs either, for these should drag the parts hither and hither, even amidst healthy stock . . . ".

Tolnay elaborated *newer regulations for animal health preservation* in 1816; these comprised instructions on the prevention and therapy of contagious and sporadic diseases of all domestic mammals. The regulations were elaborated in Latin, and were simultaneously issued in Hungarian and German, under the title "Instructions on prevention and therapy of cattle plague, and knowledge for curing those country-wide, contagious and intermittent ailments ravaging horses, sheep and swine. Buda, 1816" ("*Institutiones de praecavendis et curandis luibus cornutorum pecorum necnon equorum, ovium ac setigerorum epidemico-contagiosis et quibusdam sporadicis morbis*". Budae, typis reg. univ.).

By that time Tolnay had to abandon the anti-contagionist conception instilled by *Wolstein*. In his newer regulations he prescribed, therefore, the isolation of sick animals from the healthy stock, prohibited the driving of sick or suspect animals to markets or to "healthy land", the selling of their meat and even the stripping of their skin. In spite of these regulations outbreaks of rinderpest continued to occur.

Tolnay's contributions to the progress of veterinary science

The literary legacy of S. Tolnay reveals a prolific professional writer of research papers and popular reports. Initially he translated the books of his Viennese Professor Wolstein into Hungarian, to provide his students with textbooks in the vernacular ("Book on cattle plague", 1784; "Notes on cattle

plague", 1785; "Book on the art of healing wounds of livestock . . . ", 1785; "Book of studs in estates, with the cavalry and around the house", 1786). Of his original works mention should be made of his "Book on curing livestock" (1795), which represented an early example of well-presented popular science intended for the education of livestock farmers.

Tolnay's most important book was, however, the volume entitled "Compendium of veterinary art for the recognition and cure of epidemic-contagious and sporadic diseases of animals. With Prescriptions and Tables . . . " (*"Artis veterinariae compendium pathologicum de cognoscendis et curandis animalium epidemico-contagiosis, et praecipuis sporadicis morbis. Cum adnexis formulis et tabellis . . . Pestini, Posoni et Lipsiae*, 1799"). The use of that volume as *textbook of the veterinary course was prescribed by the Academic Board of the University of Pest from* 1805 *to* 1823; its original Latin version was translated into German, and edited twice (in 1808 and 1817) by J. J. W. Lux in Leipzig, its translation into Slovak, by M. Pan, was published in Besztercebánya in 1808, and a Russian translation, by Professor V. I. Vsevolodov, was published in St. Petersburg in 1817. The Scientific Society of Copenhagen awarded S. Tolnay a diploma of merit, and the Austrian Emperor Francis the Second (in his capacity as king of Hungary, Francis the First) expressed his highest satisfaction by awarding Tolnay the Leopold Order, for his book written "on the fair or unsightly appearance of horses, recognition of their shortcomings, and therapy of their internal and external ailments", published in Pozsony and Pest in 1804. Tolnay's merits were also recognized outside the empire: the world's first veterinary society, the Veterinary Society of Copenhagen, elected him its Corresponding Member.

PART II

Imperial and Royal Institute of Veterinary Medicine in Pest (1851–1860) and Royal Institute of Veterinary Medicine in Pest (1861–1875)

Professor Sándor Tolnay died at the age of 71 on 25th April 1818. In 1821, his assistant, Román Brunkala was assigned to Head the Department and the Institute. Brunkala's professorship was short-lived; he died of consumption in the very year, on the 12th August 1821, at the age of 39, and since he left no written work to posterity, his memory faded away. His assistant György Kozarits (Kozarics) granted the Doctor of Medicine degree in 1823 was in charge of teaching and administration until 1826, when József Hoffner (1794–1841),

Doctor of Medicine, was appointed Head of the Veterinary Department and Director of the Veterinary Institute. Immediately after occupying the Chair, J. Hoffner presented a lengthy memorandum to the Governor-General's Council about the untenable conditions in the veterinary institute. He had to re-appeal several times, until that authority agreed to move the institute to new premises in 1827. The building stood in the present seventh district (Sip street No. 20) of Budapest, and comprised seven rooms, and two kitchens and two pantries on the ground-floor and 13 rooms with two kitchens and two pantries upstairs; its stable managed 40 horses, a shed in its yard was suitable for remodelling to a blacksmith's shop, its cart-shed was remodelled to a farrier's shed, and an autopsy room was built in its garden. The permanent assistance of a junior teacher (later of two), usually a medical doctor, was provided for, and from 1834, a master of horse-shoeing was permanently employed to serve as teacher of the farrier's art.

Hoffner was also dissatisfied with the standards of education, especially with the curriculum of future *veterinary practitioners*. Without changing the contents of the course in epizootiology, he gradually extended the course in hippiatry, and expanded the scope of its subjects. He advocated the approval of Hungarian as the sole language of education (already in 1827), and elaboration of technical terms in the vernacular. He collaborated in the compilation of a (Hungarian) dictionary of medical and scientific technical terms, which was to be a publication of the Hungarian Academy of Sciences. He translated into Hungarian the veterinary manuals of Konstantin Balassa, Konrad Schwab, and Seyfert von Tennecker, and coined Hungarian terms for all subjects in which he was lecturing. He gave his lectures on "The knowledge of epidemic diseases" in Hungarian, to a joint audience of fourth-year medical students, second-year surgery students and the students of the "course in veterinary art".

Hoffner wrote his first scientific paper in Latin *(Dissertatio veterinario-medica de influxu zooiatriae in anthropoiatriam*, Pestini, 1828), but later, as he increasingly became a supporter of homoeopathy, he gradually abandoned, along with the "obsolete" doctrines of classial medicine, the associated Latin and Greek medical terminology, and adopted the—by now long extinct—vernacular terminology proposed by a contemporary medical neologistic movement headed by Pál Bugát. The literary relics of Hoffner's homoeopathist-neologist period have been passed on to posterity in the form of manuscripts: a book on "The knowledge of farriery for shoesmiths and students of veterinary art", and a Hungarian translation of Hartmann's book on the human spirit ("Über den Geist des Menschen") are available in his own handwriting. His lectures, taken down by István Kontz, fill six hand-written volumes ("Medical recognition of ailments in animals"; "The knowledge of diseases"; "Therapy"; "On the treatment of wounds"; "Stud science"; "On the external appearance of the horse"). All six volumes bear the inscription "Pest, 1830".

Hoffner's lecturing in the vernacular made the knowledge of veterinary art accessible to students not educated in Latin.

The toilsome yet fruitful life of Professor Hoffner ended on the 16th February 1841. He ultimately managed to expand and improve the "course in hippiatry" inspired by Tolnay. He was not lacking in esteem either: the Hungarian Academy of Sciences elected him its Corresponding Member in 1832.

With his attention engrossed in improvements of the veterinary school and training course, Hoffner compared to his predecessor Tolnay, did relatively little for adapting veterinary policy and disease prevention measures to current needs, which were indeed serious. Rinderpest, which had seemingly disappeared from the country after the devastating epizootic of 1801, reappeared after the Russian-Turkish war (1828–1829). It infiltrated from Romania and ravaged intermittently until 1842; it had killed 30,000 head of cattle in the first two years of its recurrence and covered the pastures with thousands of carcases again in 1832. Repeated petitions by the Medical Faculty of the University of Pest, finally instigated the sovereign to consider the nomination of National Chief Veterinarian *(regni veterinarius)* in 1832, who was to take charge of the organization and execution of disease control measures through a veterinary office affiliated to the University, and of representation at government level of matters pertaining to higher veterinary education. However, the post of the National Chief Veterinarian had remained vacant until 1838, when the proper man for the assignment was eventually found in the person of Vilmos Zlamál (1803–1886).

V. Zlamál, veterinary graduate and officer, had been assigned to manage the affairs of the Veterinary Department and Institute after Hoffner's death; two years later he was appointed Professor and Director. The 40 years of his professorship were of epoch-making importance in the history of veterinary education, veterinary science and animal health service in Hungary. Under him the Veterinary Institute became autonomous, the standards of professional education rose to internationally recognized high levels, won public esteem for the profession and increased its attractions for candidates.

Within a few months of his nomination as National Chief Veterinarian, Zlamál presented experimental evidence on the *transmissibility of rinderpest* (1838); the recognition of the infectious nature of that terrifying epizootic had a tremendous impact on further developments in veterinary policy and science.

In his capacity as newly appointed professor, Zlamál over and again sought the approval of competent authorities to increase the staff in the department and institute, and to attain autonomous management, but was consistently refused. The Hungarian War of Liberty which broke out against the Habsburg suppression in 1848, filled Zlamál with new hopes; although a foreigner (Moravian) by birth, he whole-heartedly joined the Hungarian liberty movement headed by Lajos Kossuth, and the revolutionary government appointed

him member of the newly instituted National Health Board. On Zlamál's recommendation Alajos Szabó, Doctor of Medicine, junior teacher of the Veterinary Department from 1846 was appointed Professor, and Márton Galambos, Master of Surgery and Obstetrics and graduate of the veterinary course, was appointed Assistant Professor in 1848.

On Kossuth's summons, the students took up arms, and the academic year was not opened for 1848/49. A three-month course was nevertheless started in June 1849, to train 89 civilian and military shoesmiths "in the art of farriers and horse-doctors in charge of cavalry regiment horses", with Zlamál, Szabó and Galambos serving as teachers. Zlamál recruited from the students of the course a company of home guards, and organized a course in field surgery in cooperation with János Balassa, Professor of Medical Surgery, who was appointed Director of the Medical Faculty by the revolutionary government. This field surgery course was started on the 15th November 1848, and was terminated on the 5th January 1849, by the occupation of Pest-Buda by the Austrian troops.

The War of Liberty was defeated with the assistance of the Tzar of Russia; the Hungarian army laid down arms before the Tzarist troops on the 13th August 1849.

Rinderpest reappeared in 1849 in the trail of the Russian troops supporting Austrian forces marching in through Romania, and the disease ravaged incessantly until 1865, killing about 350,000 head of cattle. At this time the control of epizootics was still in charge of medical officers of different administrative levels, and was coordinated by the Permanent Commission for Public Health.

On account of his commitment to the Hungarian liberty movement, Vilmos Zlamál was arrested with his son on the 17th October 1849. Although he was released after a short imprisonment, he was removed from his office and was placed under police surveillance for two years. After the suppression of the liberty movement, the Austrian government persevered with the germanization of all schools in Hungary. German was prescribed as the language of instruction at all levels of public education, and political control was tightened on the teachers. Development and construction were stopped in the University of Pest, the erection of a central hospital for the Medical Faculty was suspended and all departments of science formerly affiliated with that faculty were detached. The Veterinary Department was also detached from the University itself (by a ministerial order issued on the 10th August 1851), to function as an independent unit under the name "Imperial and Royal Institute of Veterinary Medicine in Pest" (until 1860). This independence was in fact rather an issue of dependence on the Austrian principle of "conformity", which shifted the reorganization of all veterinary schools and institutes of the empire on the model of the Viennese Imperial and Royal Veterinary Institute. This was not

Zlamál's conception, for he wanted to break the ties with the disorganized and helpless Medical Faculty, but never with the University itself.

Independence initially brought no change. In the academic year 1851/52, Vilmos Zlamál was reinstalled as Acting Director, Alajos Szabó as Professor, Márton Galambos as Lecturer, two junior teachers, the farrier József Szokola, two other shoesmiths, two animal hospital attendants, one autopsy room attendant and a man-servant were in charge of all functions of the institute. The course in epizootiology, held for the medical undergraduates, extended over one term, the course leading to a veterinary diploma over two terms. In 1852, the Minister of Education prescribed instruction for the veterinary students in the following subjects: anatomy, physiology, gross morphology, natural sciences, livestock breeding, theory of farriery, general pathology, casuistics, epizootiology and surgical techniques. A final examination was also prescribed, and the granting of the diploma was subject to attendance of the entire course, irrespective of the student's preceeding education (medical doctor, surgeon, farmer, farrier, equestrian). The lectures in epizootiology were attended jointly by the medical, surgery and veterinary students. The future shoesmiths also attended a practical course in farriery. With the consent of the Minister of Education, Zlamál in 1852 started a special course in veterinary science for animal husbandry, the purpose of the course was to promote the development of the more intensive methods of livestock farming, which began to supersede the traditional extensive systems in this country by the middle of the past century.

Zlamál centered research interests on the epizootiology of infectious animal diseases, especially of rinderpest. The detachment of the institute from the university degraded it to a secondary professional school, and the number of applicants steadily decreased. Zlamál's heroic struggle for its survival and development at length, came to fruition. In 1851, an independent Department was founded for the teaching of Anatomy and Physiology, and Zlamál's former Assistant Professor Alajos Szabó, Doctor of Medicine, was appointed its Head in the capacity of University Professor. In the same year, Zlamál added instruction in natural science to the curriculum, and entrusted the Lecturer Márton Galambos with its teaching. A dispensary and a new farrier's shop were also added to the institute. However, Zlamál's directorship was short-lived; by a royal order he, the Lecturer Galambos and the farriery teacher Szokola, were removed from their offices for political reasons, and Alajos Szabó was assigned to serve as Acting Director (1853).

Zlamál, Galambos and Szokola were suspended for the next three years. Zlamál was reinstalled in his Chair, but not in his director's office on the 12th September 1856, and Alajos Szabó was appointed Director.

A. Szabó (1818–1904) held that office until 1875. An era of progress followed during his directorship. On his instigation, the Imperial and Royal Ministry of Religious and Educational Matters raised funds to purchase a

spacious two-storey building (the so called Kunewalder-house), located in the present eighth district of Budapest. Szabó and his staff moved to the new institute on the 26th September 1858. The facilities offered by the new institute satisfied the highest contemporary requirements of veterinary education and service, and enabled the extension of the veterinary course to three years from the academic year 1857/58 onward. Some rooms of the spacious building were lent to departments of the Medical Faculty.

Director Szabó advertised in the papers and on placards the new curriculum and examination schedule, and informed everyone concerned about the beginning of the first term of the three-year veterinary course on the 16th November 1857. Those students, who satisfied the requirements at the final examination would be entitled to a diploma, whose holders would be free to start a veterinary practice and to issue veterinary certificates and other documents in all countries of the Austrian empire. Graduate physicians, surgeons and skilled shoesmiths could complete the course in two years from the next (1858/59) academic year on.

The place had thus been available for the extended veterinary courses, but the increase of the teaching staff necessitated by the revised curriculums was delayed by the competent authorities. The Governor-General's Council informed the Director on the 9th March 1859 that no staff reorganization would be considered for the time being. Launching of the three-year course was also hampered by the scarcity of applicants; candidates holding a certificate of at least six years' education in a grammar school preferred academic training in professions of higher public esteem. The academic course in veterinary medicine had to be stopped, and Director Szabó proposed the admission of students able to certify successful completion of the then six-year primary school and an admission examination, or of three years in the grammar school; applicants holding a certificate of the one-year veterinary course were also eligible. By a ministerial order issued on the 31st July 1859, the *veterinary course* was reduced to *two years*, and the admission requirements were reduced to completion of 17 years of age and of the primary school. Nevertheless, new subjects were added to the curriculum and a new examination schedule was prescribed. From 1863, the veterinary students had to sit for two final examinations, the first in natural sciences, knowledge of species and dietetics, chemistry, botany, general pathology and therapy, pathological anatomy, pharmacology, autopsy techniques, regional anatomy, physiology, animal husbandry, obstetrics, gross morphology and forensic veterinary medicine, the second in special pathology and therapy, surgery, surgical techniques and (from 1865) epizootiology. The stables available in the new premises of the school favoured the expansion of practical training; in 1866, 495 horses, 9 other large animals (mainly cows) and 566 dogs were admitted for treatment and training of the students. The "dog infirmary" mainly took in dogs suspected of rabies.

Director Szabó tried to increase public interest in the veterinary profession by seeking publicity himself. Pledging himself to responsibilities in social, professional and political organizations, he pressed for greater prestige of the profession in the Medical Society, Natural Science Society and other bodies. He attended the Third International Veterinary Congress in Zürich, which proposed the introduction of *meat inspection*, and recommended on his return the enactment of the congress decisions in Hungary. In appreciation of his contributions to the progress of veterinary science, the Veterinary Academy of Charkov elected A. Szabó its Honorary Member and the sovereign awarded him the title of Privy Councillor.

While A. Szabó was pressing for improvement by social activities, V. Zlamál and M. Galambos promoted the reputation of the institute by their original research work.

V. Zlamál had set his life on eradicating rinderpest. He mapped the outbreaks and demonstrated that it did not arise locally, "per se", but by introduction to the country, and had always broken in from the East. He described the exanthematous form of rinderpest, and recommended *prophylactic vaccinations* for its control (1863). He collaborated in the organization of a *Department of Animal Health* in the Ministry and in the elaboration of the rinderpest act passed in 1874. He lived to see the success of the eradication programme in 1881.

Márton Galambos (1820–1872), medical doctor, teacher and later Professor of General Pathology and Pharmacology in the Veterinary Institute, immortalized his name in veterinary literature by his first description of the transmission of rinderpest from cattle to sheep. He demonstrated that the disease usually lethal for bovines took a milder course in the ovine species, and *proposed, in 1861, to use sheep-attenuated infectious material (contagium) for the preventive vaccination of cattle.*

Further to his studies into rinderpest and the possibilities of its control, M. Galambos took a major share in the elaboration of measures against other devastating infectious animal diseases, above all rabies and malleus. Instructions on the recognition and prevention of rabies were issued by Alajos Szabó. Reduction of losses from malleus was entrusted in 1853 to a joint commission of military and civilian experts, and the veterinary corps of the army was reorganized in 1857.

A new uniform system of state veterinary procedures was issued in 1859. It was soon realised that the existing standards of veterinary training did not qualify the veterinarians for the execution of the new regulations. This circumstance and the recommendations of the international veterinary congresses on the improvement and development of professional education ultimately led to the reorganization of the training scheme in the Budapest veterinary school.

PART III

Royal Hungarian Veterinary School (1875–1890)
Royal Hungarian Veterinary Academy (1890–1899)
Royal Hungarian Veterinary College (1899–1934)

Following the political agreement between Austria and Hungary (Ausgleich)—the creation of the Austro-Hungarian Monarchy—in 1867, Professor Zlamál was entrusted with the control of veterinary policy at ministerial level. Soon afterwards an independent Animal Health Department was founded in the Ministry of Agriculture, Industry and Trade which on the 8th March 1869, was vested with authority over the veterinary school, which had formerly been the task of the Ministry of Religious Affairs and Education. The reason for that change of authority was the promotion of the animal health service to a special branch of state administration, mainly to check, as far as possible, the intermittent ravages of rinderpest which threatened to paralyze the formerly flourishing cattle trade of the country. The authorities urged the precise execution of the epizootics act of 1859, and passed the first Hungarian animal health law, Act No. XX of 1874. As a result of the execution of that act rinderpest was eventually eradicated from Hungary by 1881. This led to the rise of the veterinary profession in public opinion and the further raising of the standards could only be achieved by the development of veterinary education. After the Ausgleich in 1867, the Academic Board and the competent authorities had a free hand to develop conceptions of reorganization independently of the Vienna model. First and foremost, the teaching staff was increased. In 1870, an independent Department was founded for the teaching of "Special Surgery and Surgical Techniques", with Ferenc Varga, medical doctor, appointed as its Head, and a junior teacher in charge of assistance. Professor Galambos, who died in 1872, was succeeded in the Chair by Kálmán Czakó, Doctor of Medicine, who had been sent abroad for a study tour before entering his office. Four posts were instituted for holders of scholarships. A piece of land was purchased in Rottenbiller street (present campus site of the University) for the construction of a new up-to-date high school campus. The college phase of the institute was soon to be realised under Lajos Thanhoffer, previously Titular Professor of Anatomy in the Medical Faculty and organized by Béla Tormay (1839–1906), who was appointed Director in 1875. In the same year, another event of hitherto little historical importance had taken place: the two-year minor surgery course was definitively closed.

With B. Tormay's directorship a new era opened in the development of the school; re-named as Royal Hungarian Veterinary School, it became the *exclusive training ground for veterinarians in Hungary*. The epizootiology course for the medical undergraduates was simultaneously reduced to a minor course

in the framework of the discipline of "public health", and was entrusted to a titular professor.

A period of efflorescence started with Tormay's leadership. Hungarian was approved as the sole language of instruction from 1873 on, and the course of instruction was extended to *three years* from the academic year 1875/76 onwards, and the entrance requirements were tightened: certification of successful attendance of classes of the grammar school was required from the applicants. The curriculum was reorganized as follows: the first-year students were introduced to anatomy, physiology, physics, chemistry and botany, the second-year students to animal husbandry, general pathology, pathological anatomy and pharmacology, the third-year students to medicine, epizootiology, veterinary policy, meat inspection, surgery and farriery.

Parallel to raising the standards of education, the splitting up of the basic discipline of veterinary medicine into independent subjects was increasingly gaining ground. Specialization was suggested by Lajos Thanhoffer, and was enthusiastically supported by Director Tormay. This happened according to clinical branches. Speculation about the possible causes of disease was gradually replaced by experience gained through clinical and laboratory data. Stethoscopy and other physical diagnostic methods, such as thermometry and percussion as well as, chemical and microscopic laboratory tests were introduced; medieval uroscopy was replaced by urine analysis. The outlines of various disciplines of veterinary medicine began to take shape along the lines from which was to emerge the later internationally recognized Hungarian school of veterinary medicine.

An unprecedented improvement followed in the conditions of teaching and research with the completion of the new premises of the school in 1881. Seven pavilions designed in Italian renaissance style, and decorated with majolica works from the Zsolnay china factory, were erected on 26,831 square meters of the present university campus in a park richly planted with trees. Lavish governmental subsidies provided for an abundance of almost luxurious facilities, which were envied by the institutes of the Medical Faculty. For example, L. Thanhoffer alone had in his institute in 1881 34 microscopes, a sphygmograph, a chymograph, a micro-photography equipment, and rooms for animal surgery experiments; these facilities were not wasted — Thanhoffer's book on microscopy was translated into two foreign languages (German and Russian).

The professional and wider public was equally impressed by the contribution of the veterinary school to the National Exhibition held in 1885. Professor Azary displayed his modern instruments for meat inspection, Professor Czakó demonstrated gross lesions, monsters and parasites, Professor Nádaskay artistic anatomical preparations, Professor Thanhoffer instruments for physiological examinations and Professor Varga his armoury of instruments used for anaesthesia and aseptic surgery. The display was widely acclaimed the news even

reaching as far as Vienna; the next year, on the 5th May 1886, the monarch himself visited the school, and expressed his highest satisfaction.

This atmosphere of successful work and appreciation provided a worthy setting for the *commemoration of the school's centenary* in 1887.

However, impressing the school's development had been during the last quarter of the past century, initially there was a slight deviation from the real tasks of the veterinary profession to cope with animal diseases. Béla Tormay, outstanding specialist of livestock husbandry and erstwhile follower of the Darwinian conception, raised livestock production to flourishing level throughout the country which was appreciated by the entire body of veterinarians, but the activities of the veterinary profession were thereby primarily shifted on aspects of husbandry and management. Through the Hungarian Veterinary Association, which was founded on Tormay's instigation in 1880, from a former section of the Society of Hungarian Physicians and Natural Scientists, veterinarians took over the control of the national livestock development schemes. The splendid achievements of livestock production were however, threatened by the appalling spread of epizootics. Rinderpest was eradicated by 1881, but the prevalence of glanders, dourine and contagious bovine pleuro-pneumonia tended to increase; thousands of animals and hundreds of humans succumbed to anthrax. Rabies, too, extinguished many human lives. According to the incomplete reports of the Hydrophoby Commission of the contemporary Medical Society of Budapest, 810 humans had been bitten by rabid dogs from 1881 to 1885, and 48 of them died; within a single year (15.04.1890 — 14.04.1891), 887 cases of dog bites suspected of rabies had been reported to the authorities in 55 counties, with a fatal outcome in 56 cases. Great losses had also been caused by foot-and-mouth disease. Tens of thousands of pigs succumbed year by year to erysipelas. Rigorous measures of veterinary policy (article No. VII. 1888) were enforced to no avail, and even the best livestock production methods failed to yield breeds resistant to the contagious diseases. At the same time news from abroad, about the epoch-making experiments of Pasteur and Koch, suggested new approaches to infectious disease control. On instigation of the veterinary Professor Ákos Azary, the Hungarian Minister of Agriculture, Baron Gábor Kemény, invited Pasteur to Hungary in 1881, to demonstrate his vaccination experiments. Pasteur himself was detained, but his co-worker Thuillier came to the Budapest veterinary school and performed successful immunization experiments against anthrax on sheep. In 1884, István Lipthay, Head of the Animal Health Department of the Ministry of Agriculture, participated at a congress of hygiene held in Berlin, where he became acquainted with Koch's concepts on infectious disease etiology. The victorious breakthrough of the evolving science bacteriology put an end to the monopoly of veterinary policy relying merely on animal health policy measures and breeding techniques in the control of epizootics.

In 1884, Béla Tormay was appointed to a government office, in which he served as Director-General of all secondary and higher agricultural schools of the country, and L. Thanhoffer was temporarily assigned to serve as Director of the veterinary school. He was succeeded in 1888 by his former deputy, Ferenc Varga (1835–1898), Doctor of Medicine and Professor of Surgery (surgical techniques and wound dressing in the veterinary school).

Professor Varga distinguished himself not only by extraordinary surgical skill, but also by promoting the medical approach in the clinical branches of veterinary science. The addition of new discipline bacteriology to the school's training programme (Preisz, 1891) and the first steps of its application in infectious disease control, were also associated with Varga's directorship. The teaching and experimental work with bacterial diseases on the basis of up-to-date concepts of Pasteur and Koch had been started in the framework of internal medicine in 1881 by the outstanding scientist Ákos Azary (1850–1888), whose most promising career was terminated by untimely death. His brilliant successor, Ferenc Hutyra, was appointed to the Chair in 1888. The other departments, too, had been in charge of outstanding scientists such as István Rátz, Sándor Korányi, the later pride of home medical science, Ferenc Tangl, Gyula Magyary-Kossa, Hugó Preisz, Béla Plósz, István Bugarszky and others. In 1891, the teaching of bacteriology was referred to the National Institute of Bacteriology, founded under the auspieces of the school and also first Director of the Institute of Bacteriology, Hugó Preisz, arrived at the zenith of his career later in the Medical Faculty.

In 1890 the school was promoted and renamed as *Royal Hungarian Veterinary Academy*. In that capacity it was vested with the authority of appointing *titular professors* who supported the school staff in teaching activities. The course of training leading to a diploma in veterinary medicine was extended to *four years* on the basis of new rules and regulations elaborated by the Academic Board, and a practical course in the farming units of the royal estate of Gödöllő was added to the training programme.

The entrance requirement to the Academy was still the certificate of successful completion of six classes of the grammar school. Farriers trained in veterinary art, and employed in the Hungarian or Austro-Hungarian army, were also eligible as candidates if they had completed six classes of secondary education, or passed an entrance examination. Graduates of the agricultural academy or secondary agricultural schools were also admitted; on account of their previous education, they were exempted from attending certain courses, but not from sitting for the final examinations. Exceptional students were admitted to certain courses at request, but were not admitted to examinations and received no diploma.

In 1894, a Session on Epizootics, which was attended, among others, by the teachers of the Royal Hungarian Veterinary Academy, was held in the

framework of the Eighth International Congress on Public Health and Demography, organized by the great Hungarian medical scientist, József Fodor in Budapest. Another event of historical importance followed in 1896: the veterinary professors contributed a highly successful exhibition to the Millenary Exhibition held in commemoration of the thousandth anniversary of the conquest of the country by the Hungarians in 1896. Displays of anatomical (Nádaskay), physiological (Tangl), pathological-anatomical, parasitological (Rátz), bacteriological (Preisz), biochemical (Liebermann, Bugarszky), animal breeding (Monostori) preparations, farriery tools and preparations (Schwenszky), and various demonstrations won great professional and public esteem.

The great moral success achieved by the school at the Millenary Exhibition did not satisfy the ambitions concerning the future of the school, nor did it solve the problems of shortage in teaching staff. In his report written on the exhibition, Hutÿra commented as follows: "By its functions and attitudes, and by the qualification of its teachers, the institution is (actually) still a high school, for at present it is regrettably destitute even of the rights and external attributes of such a school. The advances experienced during the last two decades nevertheless cherish the hope that the school's development will not come to a standstill in its present stage and its standing will be raised within a short time to the level deserved already by its present achievements and urgently demanded by the progression of home veterinary science and education".

The epoch-making emergence of serum therapy in medical sciences, above all the investigations of Behring, revolutionarized infectious disease control by the end of the last century, but not as much as the ravages of swine fever, introduced to Europe from America, helped to realize the prospective development schemes. Director Varga did not live to see the promotion of the school. Due to ill-health he had to retire in 1897 and was followed as Director for the last two years (1897–1899) of this epoch by Ferenc Hutÿra (1860–1934) Doctor of Medicine, who, as shown above, had been deeply engaged in bringing about further development of the school.

On application of the school's higher authority, the sovereign on the 11th February 1899 approved the new Rules and Regulations, investing the school, re-named as *Royal Hungarian Veterinary High School*, with all rights of a college. On the 21st June 1899, the sovereign assigned Ferenc Hutÿra, Doctor of Medicine and Professor, to the post of Rector of the Royal Veterinary College.

Hutÿra held that post for 32 years, up to 1931, until 1917 by assignment, and from 1917 by repeated re-election for each successive office period. His life and professional work are described in detail in the chapter on the history of the Department and discipline of Epizootiology; recounted here are therefore only his activities in science policy and the short history of the veterinary school's "college epoch", hallmarked by Hutÿra's name. That epoch was unequivocally *the golden age of the development of veterinary education, veterinary*

science and veterinary service in this country. Hutÿra raised the school to be the intellectual centre of these three main spheres of veterinary activity. He entered his Rector's office well prepared. Already in 1890 he had written a treatise on the aspects of reforming veterinary professional education, in which he presented a profound analysis of the conditions impeding development, and advanced well-founded recommendations for future development schemes. He also stressed his objections regarding trainees of the two-year "doctoring farrier" course equivalent to veterinarians of higher education. "It seems impossible" —he wrote—"even to suppose that people who can hardly read and write were able to acquire the knowledge of veterinary medicine". Aware of the fact that the well functioning "horse-doctor corps", unique to the army of the monarchy, will not be dissolved on his entreaties, he demanded the complete segregation of the "horse-doctor" course from veterinary education and predicted the evanescence of that semi-veterinary profession by analogy of the preceding disappearance of the barber-surgery craft from the ranks of the medical profession.

Hutÿra also recommended the extension of training times in the *medical subjects* of the veterinary curriculum; he claimed that instruction in pathological anatomy, pathohistology, medicine, surgery, obstetrics, ophthalmology, etc. was inadequate, and the order of introduction to these disciplines was inappropriate, he disagreed with the contemporary system of examinations which excluded testing the undergraduates for manual skill in veterinary art (e.g. surgical interventions).

The Rules and Regulations of the Royal Hungarian Veterinary High School, issued on the 11th February 1899, prescribed the matriculation certificate of the grammar school or other equivalent secondary school, as entrance requirement and referred candidates holding a degree in medicine, pharmaceutics or agronomy to an abbreviated course of education without exempting them from reporting at the prescribed examinations (Hutÿra himself had acquired his veterinary diploma as a graduate medical doctor, after attending an abridged veterinary course). For a transitory period, "doctoring farriers", employed by the Hungarian or the common Imperial and Royal Austro-Hungarian Army, were also eligible for admission to the veterinary college, subject to passing a special entrance examination.

Initially the curriculum of the course of training and the system of examinations had changed little with the promotion to college standing. Introduction to parasitology, bacteriology and meat inspection were added to the training programmes of the fourth, sixth and eighth terms, respectively, the first final examination was extended by reporting in general pathology and parasitology, and the third final examination by reporting in meat inspection, in association with epizootiology. Those undergraduates who passed all prescribed examinations were awarded a *graduation certificate in Latin.*

In 1901, the number of the college departments was increased from nine to 10, by founding an *independent educational unit* for the pathology and therapy of infectious diseases, and *epizootiology*. The following professors had been in charge of veterinary higher education early in this century: Ferenc Hutÿra (pathology and therapy of infectious diseases, epizootiology, meat inspection, forensic veterinary medicine); Gyula Kossa (pharmacology and toxicology); Leó Liebermann (chemistry); József Marek (clinical veterinary medicine); Károly Monostori (livestock husbandry); Béla Nádaskay (descriptive and regional anatomy); Béla Plósz (surgery); Hugó Preisz (bacteriology); István Rátz (general pathology, parasitology and pathological anatomy); Ferenc Tangl (physiology). Among the junior teachers employed in the different departments at that time were István Bugarszky (Dept. of Chemistry) and Aladár Aujeszky (Dept. of Bacteriology). Róbert Dubravszky lectured on veterinary policy, Albert Breuer was invited to take charge of abattoir practicals, Ármin Schwenszky taught farriery, and József Born was tutor of the Gödöllő field course.

New subjects were gradually added to the training programme. Introduction to medical physics was included from 1905, lectures in social policy and economics were held from 1906, and meat inspection was incorporated into the curriculum as an independent subject in the same year, with Albert Breuer the surveyor of public abattoirs, assigned its lecturer. Also in 1906, a Laboratory of Milk Hygiene was founded with Dr. Ottó Fettick appointed its Head. In 1912, training in the *pathology and therapy of infertility* was entrusted with Henrik Hetzel, whose name goes down in veterinary history for pioneer investigations into this field. Agricultural and medical botany was developed to a principal subject, and Zoltán Szabó was invited as its lecturer (1913).

A welcome increase in the number of registered students indicated greater interest in the profession; candidates also applied from foreign countries, especially from Greece. Examination stipulations were tightened and the standards of examination requirements were raised to maintain the standard of the veterinary profession, which had tended to rise in public esteem and promised an ever increasing income.

With a gradual extension of the district veterinary officer system, *veterinary administration was nationalized in 1900*. Simultaneously the *National Veterinary Board* was founded, which took over all advisory duties of veterinary administration previously vested in the National Board. Appointment of the Rector of the Veterinary College, *F. Hutÿra*, as President of the Veterinary Board, increased the reputation of the school. Hutÿra also served on the Board of Examiners in charge of qualifying veterinarians for state service, and presided the Academic Board in charge of expert testimonies. These functions of Hutÿra himself and of the veterinary professors secured a central role in matters of animal health service for the veterinary school. In the meantime Hutÿra

urged the development of the college to a research centre, on a preelaborated schedule. The editorial office of the Hungarian veterinary periodical "Állatorvosi Lapok", the Fish Pathology Station and the Livestock Nutrition Research Station were in due course all lodged in the campus of the school. On Hutÿra's instigation, the excellent professors and their staff conducted intensive research work in several departments, which soon was beneficial to the entire population. The dreaded epizootics were in due course under control. Generations of well-trained veterinarians had emerged from the school to take up appointments in veterinary practice or science.

To amend the shortcomings of the preceding system of veterinary education, Hutÿra from 1898 on launched annual refresher courses for older graduates; only World War I interrupted the regular succession of these courses.

Having the right to nominate titular professors, the Academic Board of the school awarded that title for the first time in 1901.

The contributions of the college to the eradication of contagious bovine pleuro-pneumonia (1901), to the successful control of malleus, dourine, anthrax, black leg and other economically highly important animal diseases and, not in the least, the meticulous precise functioning of the nationalized veterinary service increased the reputation of the school immensely in public opinion. The ever increasing number of animals released from the school's clinics in restored health, and the reliability of post-mortem, bacteriological, toxicological and other diagnostic work contributed to this reputation.

By that time research reports from the college reflecting the high standards of its education system, the excellent organization of the veterinary service and the promising results achieved in infectious disease control had aroused the interest of foreign professional circles in the Budapest veterinary school. This led to the organization of the Eighth International Veterinary Congress in Budapest in 1905, with the attendance of leading personalities of contemporary veterinary and related sciences, such as Loeffler, Chauveau, Lignières, Bang, Laveran, Theiler, Babes, Carré, Leclainche, Chamberland, Galtier, Gavrilovich, Ferlach, Lorenz, Railliet, Vallée and many others.

The participants of the international congress were deeply impressed by the successful activities of the Budapest school in veterinary science, administration and education. The training scheme developed by Hutÿra was adopted in several foreign institutions of veterinary higher learning. The success of the congress prompted the home authorities to invest the College with the right of awarding the title "Doctor of Veterinary Medicine" to deserving candidates (from the 28th May 1906 onward). On Hutÿra's initiation, admission to the title was conditioned by original research work, submission of a thesis, and the passing of several special examinations. Admission of candidates to the college departments to work for their theses added appreciably to the capacities of the relatively limited permanent research staff.

The right of admission to the title of Doctor (right of promotion) had formerly been vested exclusively in universities. The Veterinary College had been the first of its kind in Hungary invested with that right. Three candidates were promoted to Doctor of Veterinary Medicine by the Rector Hutÿra for the first time in the school's history on the 16th February 1907.

His multiple duties and interests did not prevent Hutÿra from research work. He performed fundamental investigations into the etiology of swine fever, and elaborated a highly efficient simultaneous immunization technique against it; for the mass production of the swine fever antiserum he founded the Phylaxia Vaccine Institute Ltd. He wrote an excellent textbook of veterinary medicine, first as sole author, later in coauthorship with József Marek. The book has been re-edited many times, and was translated into all world languages. This increased the reputation of the college immensely and caused the military authorities to consider conferring the officer rank to the veterinary corps; the Royal Hungarian Ministry of Defense issued a decision on the admission of candidates for the army veterinary corps to the college for academic training in their chosen profession.

Mention should be made of the investment of the school with another privilege formerly reserved for universities; in 1917 the sovereign vested the right of electing the Rector in the Academic Board of the Budapest Veterinary College. No doubt being elected (with secret ballot) in seven successive office periods was a sign of recognition of Hutÿra's proficient leadership. Revised Rules and Regulations of the training and examination schedules were also issued in 1917.

The main purpose of Hutÿra's efforts to raise veterinary education to university standards and to adapt it to the medical training scheme had been from the beginning the reaffiliation of the Veterinary College to the University of Sciences as its veterinary faculty. However, World War I interfered, and paralyzed development for many years to come.

PART IV

Veterinary Division of the Faculty of Agricultural and Veterinary Sciences, Royal József Nádor University of Technology and Economics (1934–1945)

The period of World War I was beset with hardships in the life of the school, too. The Academic Board and the Rector nevertheless tried to press development despite the unfavourable conditions. As already noted, in 1916 the Academic Board was invested with the right of electing the Rector by ballot, and the new rules and regulations of the school, proclaimed in 1917, referred the elaboration of the curriculum and examination schedule to the sole com-

petence of the Academic Board. As a result, zoology and milk hygiene (initially as optional alternative to meat hygiene) were added to the range of prescribed subjects, and from the academic year 1918/19 onward, introduction to obstetrics was referred to an independent department. A Resurveillance Commission competent in re-examining expert opinions in civil actions was formed by teachers of the school in 1917.

Following World War I the Austro-Hungarian Monarchy disintegrated as well as the autonomy of Hungary. In the wake of the bourgeois democratic revolution proclaimed in 1918, the council of the Hungarian Veterinary Association, presided by Hutÿra, established the National Veterinary Council and joined the National Council. Until December 1918, about 800 veterinarians of the national body (about 1100–1200 professionals) announced to side the National Veterinary Council. The latter urged the re-affiliation of the veterinary school with the Budapest University of Sciences and admission of the veterinary graduates to the title of veterinary doctor automatically, without a special act to that end. The Council of Ministers promoted the school to a college of university standing in its decree issued on the 30th January 1919, but did not change the conditions for awarding the title.

Proclamation of the Soviet Republic of Hungary on the 21st March 1919 was soon followed by the constitution of another veterinary organization. About 400 veterinarians joined to form the Trade Union of Veterinarians under the auspices of the Socialist Party of Hungary, and the Veterinary Association, presided by Hutÿra, confined its activities to developing veterinary science and its specialization. The newly founded trade union elaborated a draft of professional reforms, which also included the reorganization of veterinary education, with special regard to the development of practical training. The revolutionary zest of the Soviet Republic was reflected in its policy of training to resolve all problems promptly. The reorganization programme proposed in 1919 reflected the—traditional—progressive outlook of the veterinary professors and their active interest in social reforms. However, the defeat of the Hungarian Soviet Republic frustrated the implementation of the reformist conceptions.

Troops of the Royal Romanian Army, marching to Budapest on the 4th August 1919 within the scope of the military intervention leading to the defeat, threatened to expropriate 50 per cent of the equipments and museum pieces of the school to transport them to Romania; Hutÿra as Rector by a diplomatic move was able to prevent the plunder. The life of the country and the school slowly normalized after the tempestuous historical crisis; the uninterrupted course of teaching could only be resumed on the 1st March 1920. However, reactionary tendencies took over the revolutionary zeal and hopes for social reforms; the "numerus clausus" (restrictions upon the admission of Jewish candidates to tertiary education) was imposed by the government on all tertiary institutions of the country from the Academic Year 1920/21 onward.

The economic crisis following World War I began to subside by the late 'twenties. The deteriorated buildings of the school were renovated, and some equipment could be purchased, but no funds were available for research. Later various organizations volunteered to support the reputed veterinary school by grants. In 1930, a new pavilion was erected for the clinic of obstetrics, a gymnasium was built and the clinic of surgery was reconstructed. Youth organizations took charge of student welfare by securing various benefits of which most students were badly in need. However, the nationalistic, reactionary tendencies pursued by the Horthy-government were also enforced on the secondary schools, and in the given political situation, increasingly gained ground in the student organizations of the veterinary school.

Regardless of the darkening political arena, conceptions of development were still cherished. As disclosed by the contemporary documents, apart from the economic problems, promotion of the school to university standing had been the recurrent main topic of the rector's addresses at the opening of each academic year and at meetings of the academic board. Rector Hutÿra, endowed with the title "Rector Magnificus" and with the right to wear the rector's carcanet in 1923, continued to urge (since 1906) the re-affiliation of the school with the University of Sciences, on the model of the Veterinary Faculties of foreign universities (Bern, Zürich, München and Dresden); he also proposed, in case of reluctance of that university to affiliate a veterinary faculty, the foundation of a university of agricultural (and economic) sciences. Promotion of the veterinary college to a university faculty was realised in 1934, but in a completely different form as conceived by the Academic Board.

Efforts to improve the training programme were also realised. In 1924, a ninth term was added to the curriculum for field training. The active collaboration of the school's teaching staff in the elaboration and implementation of the Animal Health Act (article XIX), issued in 1928, enhanced the relationship with the professional practice. The Animal Health Act determined the responsibilities of veterinarians for many years to come. This huge work was in charge of Vilmos Horváth, a senior officer of the Ministry of Agriculture, who was an invited lecturer of the compulsory subject "State administration and veterinary policy" from 1933 to 1939.

The teaching staff was gradually increased, in 1930, the professors of the veterinary school numbered 12 (the highest force in the interwar period) for a transitory period.

Public appreciation of the school led to its permanent representation in the House of Parliament; from among its professors Ferenc Hutÿra (1926–1933), József Marek (1934–1935) and Ágoston Zimmermann (1937–1944) served as MPs in succession, and Oszkár Wellmann was additionally delegated to represent the National Agricultural Association.

Ferenc Hutÿra resigned from his post of Rector in 1931 and was succeeded by Oszkár Wellmann, and from 1933 by Ágoston Zimmermann.

F. Hutÿra also retired from his Chair in 1933, at the age of 73, after 47 years of ardent work for the improvement of the veterinary service and education. He immortalized his name not only by invaluable contributions to the advancement of the profession, but also as a veterinary scientist of international reputation.

With the resignation of this leading personality radical changes soon followed in the constitutional form of the school. By a governmental decree (Article X) issued in 1934, the Royal Veterinary College was affiliated with the Royal Hungarian József Nádor University of Technology and Economics, established in that year by amalgamation of various colleges and university faculties. The objections raised by the Academic Board of the school to the Bill were expressed by the M.P. Professor J. Marek in Parliament. He pointed out that although Article X was in principle welcome, as far as it concerned the promotion of a uniform development in the branches of science covered by amalgamation, yet it was feared that this world-renowned Veterinary College would be seriously handicapped by degrading it to a mere division of the Faculty of Agricultural and Veterinary Sciences by a practice unparalleled in foreign institutions of veterinary higher learning. Moreover there were fears by the Academic Board that the school would lose certain departments under the proposed schemes of reorganization. The Bill was nevertheless passed without modification. — Affiliation to the University of Technology and Economics was advantageous for the teachers inasmuch as it admitted them to the higher university ranks and the corresponding higher salaries, and favourable for the development of education and research by interaction of interdisciplinary tendencies, but the disadvantages of reorganization were obvious. The University of Technology and Economics having been referred to the authority of the Ministry of Religious Affairs and Education, the former Veterinary College, degraded to a division, lost the subsidies contributed by its former higher authority, the Ministry of Agriculture, lost three of its 12 Departments (Chemistry, Physics, and Milk Hygiene—the latter was reduced to a minor laboratory unit), and lost its M.P. The Veterinary Society and the veterinary students protested by abstaining from the lectures and by demonstrations on the 22nd March 1934. But all parties concerned resigned themselves to the immutability of the situation, and the academic year 1934/35 was opened under the new constitution of the Veterinary Division.

On the 20th March 1937, the Veterinary Division commemorated the 150th anniversary of the beginnings of veterinary education in Hungary by unpretentious ceremonials led by Károly Jármai, Dean of the Faculty of Agricultural and Veterinary Sciences. The statue of Ferenc Hutÿra and a memorial of Sándor Tolnay were erected in the campus of the school from public dona-

tions, to commemorate their imperishable merits in the development of veterinary education and science in Hungary. The anniversary prompted Sándor Kotlán, the outstanding Professor of Veterinary Parasitology, to write a book on the history of veterinary education in Hungary (date of publication: 1941), and András Daday, M.D., Titular Professor of Veterinary History in the school, to open a permanent exhibition of his collection of veterinary relics, which represented the first museum of veterinary history in Europe. The school had reasons to take pride in its achievements. In 1941, five of the seven professors employed in the Veterinary Division were Members of the Hungarian Academy of Sciences, and many foreign students (mainly Greeks and Bulgarians) had chosen to study for their veterinary degree in the Budapest school.

Premonitions of the approaching Second World War and of political attachment to Nazi Germany had increasingly come to the fore in the late 'thirties also in university life. Á. Zimmermann, who was Dean in the academic year 1939/40, protested against the exaggerated centralization of administrative matters, and against the restrictions imposed upon university autonomy to tighten state control on matters of education. There was, of course, no chance for amendments. World War II broke out, and its events air-raids and increasingly interrupted the normal course of teaching. On the 19th March 1944, the German troops occupied the country. Several veterinary professors demonstrated anti-fascist attitudes, heedless of their risks. The war was inevitably approaching its end; the Soviet army was advancing to the suburbs of Budapest. The Ministers of Religious Matters and Education ordered the removal of veterinary students of the third and fourth years to Germany "to ensure the conclusion of their studies by an abbreviated course". The Academic Board protested in vain; 139 students were re-settled in Vienna, with four professors forced to join by summons. The abbreviated course was held in Vienna from the 14th December 1944, until the end of March 1945, but the displaced students and teachers were not able to return until summer. The Academic Board later recognized the Vienna course on the condition of re-examination. While the senior students were displaced, the junior ones (of the first and second year) were for the most part called up to do military service, and teaching in the university was interrupted.

PART V

Veterinary Faculty of the Hungarian University of Agricultural Sciences (1945–1952) College of Veterinary Science (1952–1962) University of Veterinary Science (1962–)

With Budapest besieged by the Soviet army, the day of liberation dawned on the veterinary school on the 15th January 1945. By the 14th February about 50 employees resumed their duties, and with the professors reappearing, life returned to the institution.

The first task awaiting volunteers was the clearing away of the ruins. Three bombs had been thrown on the campus area, and many artillery missiles had wrecked the buildings, but on the whole, no irreparable damage had been caused by the war. As a result of ardent work, teaching could be started on the 16th April 1945; the abbreviated first term lasted until the 31st May, and the second term was completed in a session from the 1st June to the 15th September 1945. These courses made up for the academic year 1944/45.

In summer 1945, the veterinary school was again involved in reorganization. It was detached from the University of Technology and Economics, and was affiliated to the newly founded Hungarian University of Agricultural Sciences, to function as the latter's Veterinary Faculty from the academic year 1945/46 on; with that organizational change, the authority over the Faculty was reinvested in the Ministry of Agriculture. The professors Endre Gy. Guoth, Sándor Kotlán, János Mócsy, Gyula Sályi, and again Sándor Kotlán served in succession as Deans of the Faculty.

For several years after the war quite often even the minimal requirements were lacking for undisturbed operation of the veterinary clinics and laboratories, but the promotion of the school to a university faculty slowly but surely improved its changes, and enabled the addition of new departments. Independent departments were founded for the teaching of forensic veterinary medicine and veterinary administration, and of food hygiene, in 1946 and 1949, respectively; a polyclinic for outpatients was founded in 1948; a department for military training in 1951 (it functioned until 1957). In 1952, instruction in clinical veterinary diagnostics was referred to an independent department into which the polyclinic was incorporated; this dual unit functioned until 1962, when the Department and Clinic of Medicine was entrusted with the teaching of diagnostics, and the Outpatient Clinic was promoted to an independent unit. In 1949, a new department was founded for teaching Russian and later other foreign languages, and another new department was entrusted with physical education (1950).

Further to the post-war economic problems, political struggles also encumbered national life and education. With the battle of the political parties having been consolidated in 1948, its benefits were gaining ground in the veterinary school, too. The teaching programme of the first-year students had been reorganized from 1945/46, the ninth term covering the field course was, after suspension in the war years, re-commenced in 1946/47, and a comprehensive educational reform, introduced in 1948, prescribed, among others, certification of successful end-term examinations as admission requirement to each successive term from the second to the ninth.

With increased economical and political stabilization, the quota of undergraduates was steadily raised from the academic year 1946/47 onward. This was urgently needed for various reasons. The main reason was eradication of some infectious diseases (such as malleus) and protection from others (such as swine fever and Newcastle disease) of the livestock left over after decimation by the war. Later the socialist reorganization of the structure of agriculture, more precisely of intensive livestock farming, required an ever increasing veterinary collaboration. From the academic year 1951/52, the training course was prolonged to 10 terms, and the curriculum and examination schedule was adapted to the new demands. The main objective of extension was widening the scopes of training in certain disciplines of major importance.

Introduction of a new system for awarding postgraduate scientific degrees (Candidate of Science; Doctor of Science) in 1950 temporarily involved withdrawal from the universities of their right to award the doctor's degree (Doctor of Veterinary Medicine); they were restored to that right in 1956.

Tensions in international politics and rising mistrust in the home political administration stifled the atmosphere of the country and its schools in the early 'fifties.

The constitutional form of the veterinary school was changed again in 1952. It was segregated from the agricultural university (which, in seven years, had grown almost unmanageably large), and was established in the position of an independent College. Although this standing involved more freedom in managing the school's affairs, and the professors of the school were entitled to hold their former university ranks, it nevertheless represented a kind of retreat from the school's preceding situation and objectives.

Adaptation to the changed situation was a hard trial for the leaders and teachers of the school. The professors Vilmos Csiszár, János Mócsy, László Urbányi, again János Mócsy and Gyula Sályi in turn served as directors of the Veterinary College until 1962.

In 1949, an Office of Education was established in the school and was entrusted with the execution of the orders of the higher authorities; this office also took charge of issuing lecture-notes and textbooks for the students. In the mid-fifties, the steadily increasing class sizes raised some difficulties; the total

student number was the highest (845) in the academic year 1954/55. The teaching staff was also considerably increased in the meantime; it numbered 87 in 1956, almost three times more than before 1945. In 1954, a governmental decision on matters of public education prescribed the introduction of a state examination after the conclusion of all courses.

Improvement of the economic situation enabled further developments in the standards of education and research facilities. In 1953 the Department of Botany and the Department of Marxism-Leninism were founded, the latter to widen the scope of introduction to social sciences. In the same year, the formerly optional course in biochemistry as well as agricultural production was added to the curriculum as a compulsory subject. In 1954, animal hygiene and farm management were also introduced and further to the prescribed course in the Russian language, optional courses were offered in other foreign languages as well. In 1958, fish pathology (optional since 1953), and diseases of honey bees, in 1959 agricultural economy, were integrated into the disciplinary programme.

Problems of accommodating the increasing number of students also had to be solved. While before 1945 rather poor lodgings were available for 12 students only, in the 'fifties two student hostels, accommodating on a total 370 persons, were run by the school for its undergraduates. The addition of new departments, and development of old ones also urged the gaining of more space.

Although the teachers were preoccupied with their educational duties, they did not give up research interests, mainly in topics whose investigation helped to resolve current problems arising from the transformation of the structure of agriculture. These contributions were duly appreciated by the government; the Kossuth Prize (state prize), founded in 1948, was awarded to five active and two retired professors of the veterinary school. — Later, in 1983, three veterinary professors were awarded the state prize.

In October 1956, restlessness, upheaval and counter-revolutionary propaganda also pervaded the minds in the veterinary school, but the general soberness of the students and teachers saved the institution from major riots. No serious damage occurred, and only a few students joined the armed actions of the counter-revolutionary forces. The three-month drop-out in the course of teaching was compensated by reorganization of the current academic year.

As already noted, in 1957 all institutions of higher learning regained the right of awarding the title of doctor to deserving candidates. The pertinent decree of the Minister of Education commissioned the veterinary school to award the title as a professional attribute. The title "Doctor of Veterinary Medicine" was restored retrospectively, first to graduates of the years 1951—1956, and in 1960, on special request, to all former graduates as well. In 1962, the school commemorated the *175th anniversary of the beginnings of veterinary education in Hungary* with representatives of many foreign sister intitutions, which had been fostered in the meantime, establishing good relations. On that

occasion by enactment of the law decree No. 22, issued by the Presidential Council of the Hungarian People's Republic in 1962, the Veterinary College was promoted to "*University of Veterinary Science*", in appreciation of its contributions and achievements in veterinary education and science. Professor Gyula Sályi, former Director of the College, was appointed to head the university as Rector for the academic year 1962/63. The promotion of the school provided the moral support and the improving economic situation of the country the finances for considering schemes of reconstruction and new constructions in the university campus. In 1965, Jenő Kovács Rector announced to the Academic Board that the university's higher authority agreed to raise funds for renovation of the available premises and construction of new buildings. The construction work was started in 1969. Some old buildings located in the construction site (pavilions housing the Department of Obstetrics and some minor units, and the gymnasium) were demolished in January 1969, and on the 17th September 1969, András B. Kovács Rector, who had pressed the matter with tremendous energy, laid the foundation stone of the new buildings. This was the first major development in the school's history since 1880. The last two sentences of the memorandum, placed in the foundation stone read as follows: "Our obligations to the past and future have caused us to initiate this development. Our successors are left with the obligation of promoting development in accordance with future demands on the University of Veterinary Science." The construction was carried out in two stages. In the first stage, instead of the originally planned 10-storey building, four semi-detached three-storey buildings were erected and occupied by the departments in 1974, when Ferenc Kovács held the office of Rector. A spacious aula was added to these buildings, with a gallery for the permanent exhibition of the university's collection of veterinary relics (veterinary museum), reorganized and completed by Dénes Karasszon. Also in the first stage of construction the University's new student hostel was completed and named after József Marek. The hostel, a four-storey building erected outside the campus on a site of nearly two hectares, has provided comfortable accommodation for 261 students and 60 veterinarians attending postgraduate training courses held at the University, in suites comprising a study-bedroom for three persons, with bathroom and anteroom. The hostel has been functioning since 1973.

New departments and other units were also founded under the development scheme. The Department of Animal Hygiene was founded in 1962, and Animal Nutrition, which had formerly been part of the main discipline livestock husbandry, was referred to the competence of an independent department in 1963. Thus the total number of the departments rose to 19. A helminthological research laboratory was founded under the auspices of the Department of Parasitology in 1960, and a blood group laboratory (which continued to function from 1969 on as an independent unit) was established in the Department of

Animal Husbandry in 1961. The minor radioisotope laboratory, which had functioned in the Department of Physiology from 1955, was extended to a well-equipped radioisotope unit in 1964. The first climatic chambers, affiliated to the Department of Animal Hygiene, were completed in 1966. An electrocardiology unit was established in the Department and Clinic of Medicine in 1969, the electron microscopy unit of the Department of Pathology established in 1971, and the X-ray laboratory of the Department and Clinic of Surgery was reconstructed in the same year. The central photography laboratory was established in 1974, and the duplication unit was renovated and re-equipped in 1975, to step up the issuing of lecture-notes. In 1968, the students themselves volunteered to remodel the spacious cellar rooms of the university's present central library to youth club rooms.

The old buildings of the University were renovated parallel to the construction works, to improve the conditions of training and research. By the mid-'eighties, the foundation of a Central Laboratory unit was decided, to improve the utilization of large instruments located in different departments and to introduce a uniform system of biochemical testing.

In 1955, in addition to Russian, prescribed course in a second foreign (Western European) language was integrated into the curriculum. Practicals were gradually expanded during the 'sixties; the ratio of the total hours devoted to lectures and practicals under the current training schemes rose to 44 : 56 compared to 70 : 30 in the academic year 1949/50.

In the 'sixties, the body of graduate veterinarians attained the target number ($>$ 3000) demanded by the reorganized socialist system of livestock production (veterinarians numbered 1143 in 1938). The quota number of annual admissions was therefore reduced to 80–90, and the rigorous entrance examination provided for a satisfactory selection of candidates from applicants exceeding this number by several times. Foreign students have been increasingly admitted; their average number has risen from 6–9 in the 'sixties to a round 50 in the 'seventies. Most foreign candidates have come from developing countries of Asia and Africa, but several from highly developed countries (USA, Canada, FRG, etc.). The cooperation agreements of the University with foreign sister institutions have been extended to the exchange of Hungarian and foreign veterinary students for between-term practicals (for details see the chapter on education).

The teaching staff numbered 103–105 in the 'sixties, and the University's scientific staff (20–30 in the 'sixties, 40–50 later on) has also responsibilities in education. This assistance has been greatly needed for, since 1955, the University has been assigned by decision of the Ministry of Agriculture to take charge also of postgraduate veterinary education. In the early 'seventies a system of two-year courses for postgraduate specialization was developed in addition to the refresher courses held regularly every year (see details in the chapter on

postgraduate training), and a group was established for organizing and handling the matters of postgraduate training.

Difficulties arising from shortage in well-trained animal health technicians also had to be surmounted in the 'seventies. From the academic year 1978/79 onward, animal health technician training was reorganized by starting courses leading to a certificate in specialized fields of animal health art (calving assistant, herd health surveyor, etc.) under the auspices of 10 secondary professional schools of the country. Former ministerial conceptions on conducting parallelly higher animal health education at two (college and university) levels were—temporarily—also realised in the late 'seventies. A School of Veterinary Engineering was established in the large provincial town Hódmezővásárhely and was affiliated to the University of Veterinary Science as its Faculty. The first academic year of the school was opened by the Rector of the University, László Várnagy, on the 7th September 1979. The three-year course of instruction of the school covered introduction to the technical aspects of veterinary medicine, which have come to the fore with the progression of mechanization and automation in the intensive livestock farming systems. Seven departments, as Animal Health, Animal Hygiene, Animal Husbandry, Technology, Animal Nutrition and Chemistry, Farm Management, Marxism-Leninism take care of the animal health engineering course. Careers are open to the graduates of the school at different technical levels of animal health management, in large livestock production units, of agricultural plants, in special functions of veterinary administration and in the veterinary institute, for the execution of duties not requiring university level education. Refresher courses in aspects of veterinary engineering have recently been added to the responsibilities of the school. Since 1981, *Imre Facsar* has served as its Director.

The revised curriculum of the University, introduced from 1974/75, prescribed a so-called complex state examination, which comprised a comprehensive oral test in all aspects of veterinary medicine, and a written thesis. The new type of state examination introduced for the first time in 1979, did not come up to the expectations, and from 1983 onward, the oral test was again limited to three main disciplines (veterinary administration, animal hygiene, epizootiology), without changing the requirements set for the written thesis.

In the early 'eighties, improvement of the technical facilities of demonstration during lectures and practical classes was initiated. The scheme of renovation and re-equipment of the lecture rooms and work-rooms was drafted, and was approved by the competent higher authority, which offered generous subsidies for the purchase of equipment. Renovation was started while Andor Kardeván was the Rector, and up-to-date equipment (slide and film projector, videotape, etc.) was installed successively wherever required. Renovation of the Lecture hall was completed in the Department and Clinic of Surgery in 1983, and in the Departments of Anatomy and of Pathology in 1985. In the in-

terim the undergraduates' laboratories functioning in the Departments and Clinic of Obstetrics, Parasitology, Pathology and Anatomy, were re-equipped. The renovation is still in progress in the other departments. In 1984, a special work group of advanced training facilities was entrusted with handling and managing the audio-visual equipments.

The reconstruction and extension of the University's Central Library, completed in 1984, goes down in the school's history as a major achievement. The entire building which had housed the school's central offices from 1881 to 1972, was remodelled for use of the library, which now offers in its traditional setting a variety of services satisfying all contemporary demands. An invaluable collection of ancient veterinary literature, with a permanent exhibition of its choicest pieces, has been located in the library. Another collection of professional relics portraying the 200-year history of veterinary education in this country is also managed by the library staff. The permanent exhibition of that collection (the university museum), located in the gallery of the University's aula, was opened by Ferenc Kovács Rector in 1984.

Under the Bill of Education (no. I) issued in 1985, the Academic Board, headed by Ferenc Kovács Rector, worked out a comprehensive project for developments in education until 2000 A.D.

The main principles of the development scheme are the following:

— To widen the scopes of the *personality* and professional outlook of the students by a more objective approach to practical life and knowledge, based on didactic improvements by introduction to the current disciplines and on induction of integrated (inter-disciplinary) thinking;

— to augment the knowledge of natural sciences in general by raising the standard of instruction in the subjects covered by the preclinical studies to the highest levels;

— to promote the development of creative and adaptive approaches to everyday work, and of organizational talents, in the interests of equipping the future veterinarians with intellectual powers required for sudden decisions and reorganization;

— to adapt the contents of training in clinical veterinary medicine, pathology and laboratory diagnostics to approaches enabling the early diagnosis of the increasingly emerging multifactorial diseases of complex or indefinite etiology;

— to widen the scopes of training in (agricultural) economics permitting an insight into the economic micro- and macro-structure of livestock production, of which the future veterinarians are expected to be aware;

— to raise the standards of introduction to the practical aspects of the veterinary profession, and to equip the (present and future) tutors of practical courses with the didactical and pedagogical knowledge required for successful tutoring;

— to reinforce biotechnical and biotechnological knowledge with the aim of improving genetic work, reducing the prevalence of adaptation syndromes, preventing the introduction of infectious diseases by imports of breeding stock and improving the reproduction performance of livestock;

— to improve methodical approaches and facilities for learning foreign languages, and to utilize and reward the services requiring fluency in foreign languages at both undergraduate and graduate staff level.

The Unit of Advanced Training facilities and the Central Laboratory of the University have recently been founded to promote the objectives of the education development project.

The *Central Laboratory* has been entrusted with the laboratory services and research projects requiring highly sophisticated equipment. The main topics of research in charge of the Central Laboratory have been geared at improving feed utilization and the early diagnosis of metabolic and reproduction disorders due to dietary factors. The Central Laboratory has also been assigned to promote connections with livestock production.

The *Unit of Advanced Training Facilities* has been in charge of applying and developing the technical equipment facilitating the execution of training and research programmes based on current principles of applied informatics.

Strengthening of organized cooperation with veterinary and other institutions in research programmes and other matters of common interest has also been proposed under the development project.

The moral backing and financial aid required by the University to put its development project into effect has been generously provided by its higher authority, the Ministry of Agriculture and Food, with the active cooperation in all matters of importance, of the Deputy Ministers, Lajos Dénes and László Papócsi, themselves graduates and invited lecturers of the University of Veterinary Science.

The widely appreciated system of the Hungarian Animal Health Service has, from the very beginning, unfolded under the auspices of the Alma Mater. The school has increasingly relied on the cooperative assistance of many outstanding specialists of that service, in the practical education of its trainees, and in research problems as well, and has been anxious to reinforce its connections with the service at various levels. That feedback of the intellectual potentials thriving outside the school has been regarded as the pledge of satisfying future demands on the profession by well-oriented education and by maintaining mutually advantageous connections between the Alma Mater and the everyday practice of veterinary art and science.

*

This portrays the various difficulties which have to be surmounted to raise the veterinary school to its present standing, and the many great personalities who have set their lives on its development. From the very beginning, the professors of this school have united their efforts to satisfy contemporary demands on the profession in undergraduate and postgraduate education and practice-oriented research. This brief review, it is hoped, will contribute to reviving those traditions which may give future veterinarians a new impetus in the right ways to progress in their chosen calling, and in the development of the Alma Mater.

Principals of the Institution

Department and Institute of Veterinary Medicine of the Medical Faculty, University of Pest

Heads of the Department:

Sándor Tolnay	1787–1818
Román Brunkala	1821
György Kozarics	1821–1826
József Hoffner	1826–1841
Vilmos Zlamál	1841–1851

Institute of Veterinary Medicine in Pest

Directors:

Vilmos Zlamál	1851–1853
Alajos Szabó	1853–1875

Royal Hungarian Veterinary School

Directors:

Béla Tormay	1875–1888
Ferenc Varga	1888–1890

Royal Hungarian Veterinary Academy

Directors:

Ferenc Varga	1890–1897
Ferenc Hutÿra	1897–1899

Royal Hungarian Veterinary College

Rectors:

Ferenc Hutÿra	1899–1931
Oszkár Wellmann	1931–1933
Ágoston Zimmermann	1933–1934

Veterinary Division of the Faculty of Agricultural and Veterinary Sciences, Royal József Nádor University of Technology and Economics

Deans:

Ágoston Zimmermann	1934–1935
Béla Reichenbach	1935–1936*
Károly Jármai	1936–1937
Zoltán Szabó	1937–1938*
Henrik Hetzel	1938–1939
Ferenc Kövessi	1939–1940*
Rezső Manninger	1940–1941
Károly Ihrig	1941–1942*
Dezső Deseő	1942–1943
Endre Gy. Guoth	1943–1945

Veterinary Faculty, Hungarian University of Agricultural Sciences

Deans:

Endre Gy. Guoth	1945–1947
Sándor Kotlán	1947–1949
János Mócsy	1949–1950
Gyula Sályi	1950–1951
Sándor Kotlán	1951–1952

College of Veterinary Science

Directors:

Vilmos Csiszár	1952–1954
János Mócsy	1954–1956
László Urbányi	1956–1957
János Mócsy	1957–1958
Gyula Sályi	1958–1962

University of Veterinary Science

Rectors:

Gyula Sályi	1962–1963
Jenő Kovács	1963–1966
András B. Kovács	1966–1972
Ferenc Kovács	1972–1978
László Várnagy	1978–1981
Andor Kardeván	1981–1984
Ferenc Kovács	1984–

* In these years, the deans were elected from among the professors of the Agricultural Division.

STRUCTURE OF THE PRESENT INSTITUTION (UNIVERSITY OF VETERINARY SCIENCE)

T. JANKOVITS, Secretary-General of the University

The supervising authority of the University of Veterinary Science is the Education and Research Division of the Ministry of Agriculture and Food. Since the Division of Animal Health and Food Hygiene also belongs to that ministry, the connections between the Alma Mater and the veterinary service have been traditionally intimate and fruitful. Continuous exchange of information between the school, the service and the higher authority have enabled the Ministry to carry into effect newer demands on the profession at the level of education, and have ensured the continuous creative cooperation of the University in the resolution of country-scale veterinary problems.

The principal of the University is the *Rector;* three Deputy Rectors and the *Council* assist him in the execution of his duties. The Deputy Rectors, the principals of the Faculty of Veterinary Engineering (Hódmezővásárhely), the leading functionaries of the University's political and social organizations, the Secretary-General, the Director-General of Finances and the Staff Manager serve as members of the Council.

Decisions and comments concerning educational and personal issues are referred to the competence of the *Academic Board.* Members of that Board are, apart from the Council Members, the heads of the educational and research units, and the enfranchised representatives of the social organizations, of the undergraduates, and of the teaching and technical staff. Decisions on personal issues are taken by ballot.

The *Teachers' Conference,* attanded by the permanent teaching staff and the titular professors and readers of the University and its Faculty of Veterinary Engineering, is entitled to elect or recall by ballot the teacher-members of the Academic Board; these Members are obliged to report to the Conference on the issues accomplished.

The execution of educational, scientific, administrative, ethical and other duties related to the functions of the University, and of current issues demanding cooperative work, is assisted by the advisory activities of temporary or permanent *commissions,* which are participated, if required, by invited experts of the state administration or the (livestock or food) industry.

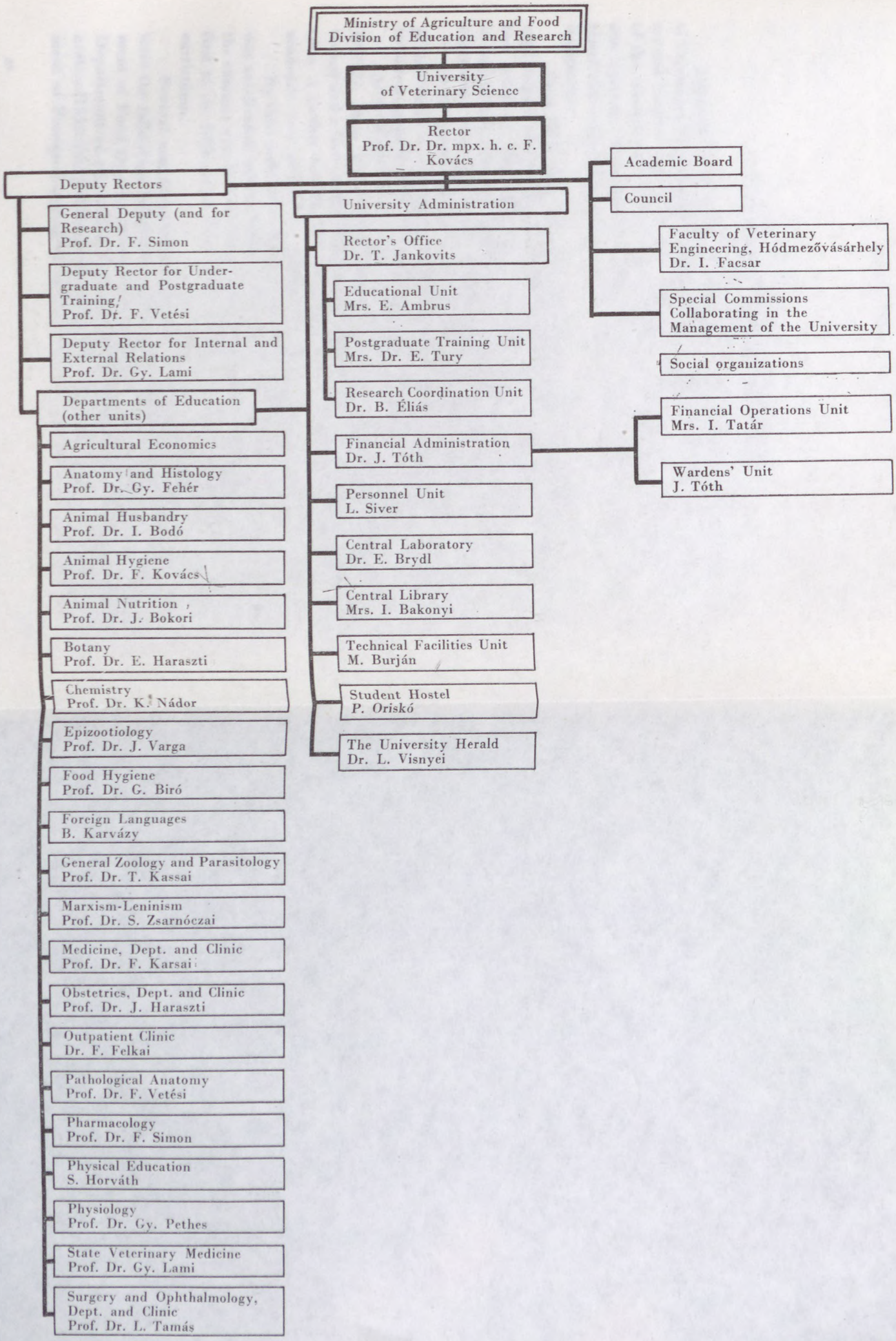
The administrative affairs of the University are managed by the Secretary-General, the financial affairs by the Director-General of Finances.

Undergraduate and postgraduate training, and professional research is in charge of the Departments of the University and its Faculty. Educational and research work are supported by the University's Central Laboratory, Technical Facilities Unit, Central Library, as well as by cooperating scientific institutions, county animal hospitals and many collective and state farms, which also take charge of practicals for the undergraduates.

The student hostels run by the University and its Faculty (Hódmező-vásárhely) offer comfortable accommodation and favourable conditions for individual study, cultural programmes and sports.

The political and social organizations functioning at the University and at the Faculty render valuable assistance to the execution of current and prospective issues. The trade union branch organization stands for affairs of the staff, the student committees take up the interests of the students and take charge of their political and cultural education.

A schematic presentation of the current structure of the University of Veterinary Science, with the names of the persons in charge of the different educational and other units, is shown in the chart below.


Ministry of Agriculture and Food
Division of Education and Research
University of Veterinary Science
Rector
Prof. Dr. Dr. mpx. h. c. F. Kovács
Deputy Rectors
General Deputy (and for Research)
Prof. Dr. F. Simon
Deputy Rector for Undergraduate and Postgraduate Training
Prof. Dr. F. Vetési
Deputy Rector for Internal and External Relations
Prof. Dr. Gy. Lami
Departments of Education (other units)
Agricultural Economics
Anatomy and Histology
Prof. Dr. Gy. Fehér
Animal Husbandry
Prof. Dr. I. Bodó
Animal Hygiene
Prof. Dr. F. Kovács
Animal Nutrition
Prof. Dr. J. Bokori
Botany
Prof. Dr. E. Haraszti
Chemistry
Prof. Dr. K. Nádor
Epizootiology
Prof. Dr. J. Varga
Food Hygiene
Prof. Dr. G. Biró
Foreign Languages
B. Karvázy
General Zoology and Parasitology
Prof. Dr. T. Kassai
Marxism-Leninism
Prof. Dr. S. Zsarnóczai
Medicine, Dept. and Clinic
Prof. Dr. F. Karsai
Obstetrics, Dept. and Clinic
Prof. Dr. J. Haraszti
Outpatient Clinic
Dr. F. Felkai
Pathological Anatomy
Prof. Dr. F. Vetési
Pharmacology
Prof. Dr. F. Simon
Physical Education
S. Horváth
Physiology
Prof. Dr. Gy. Pethes
State Veterinary Medicine
Prof. Dr. Gy. Lami
Surgery and Ophthalmology, Dept. and Clinic
Prof. Dr. L. Tamás
University Administration
Rector's Office
Dr. T. Jankovits
Educational Unit
Mrs. E. Ambrus
Postgraduate Training Unit
Mrs. Dr. E. Tury
Research Coordination Unit
Dr. B. Éliás
Financial Administration
Dr. J. Tóth
Financial Operations Unit
Mrs. I. Tatár
Wardens' Unit
J. Tóth
Personnel Unit
L. Siver
Central Laboratory
Dr. E. Brydl
Central Library
Mrs. I. Bakonyi
Technical Facilities Unit
M. Burján
Student Hostel
P. Oriskó
The University Herald
Dr. L. Visnyei
Academic Board
Council
Faculty of Veterinary Engineering, Hódmezővásárhely
Dr. I. Facsar
Special Commissions Collaborating in the Management of the University
Social organizations

EDUCATION IN THE UNIVERSITY OF VETERINARY SCIENCE

F. VETÉSI, Deputy Rector

1. A short historical background

Although the only veterinary school of Hungary, the present University of Veterinary Science, had evolved 200 years ago from a university department, several decades elapsed until veterinary training was raised, in the strict sense of the word, to an academic level. Gradual extension of the training period, and tightening the admission requirements in respect of previous training, have raised this school in the course to standards equal to those of other university institutions.

From 1899, when the school was promoted to college standing, candidates applying for admission have been required to hold a *secondary school matriculation certificate*. The higher admission requirements enabled the advancement in instruction in those disciplines which formed, and still form, the body of the curriculum in all up-to-date veterinary colleges of the world.

Field courses have been part of the curriculum since 1890. The period of prescribed field training, which had been one month up to 1922, was prolonged to four months in 1934 and to six months from the academic year 1940/41 on.

After World War II, the curriculum was revised in the academic year *1946/47*, when the lecture period was extended to *four and a half years* (nine terms) and a five-month field course was added to the curriculum over a tenth term. A further extension of the training period to *five years* followed from the academic year *1951/52* on (Table 1).

By that time the field course, which had originally covered one full term, was subdivided into one-month *field practicals* intercalated between terms in the summer vacation or winter exam periods of every academic year, from the first to the fifth, for a total of 29 weeks, with programmes prescribed in the curriculum.

Several *new departments* were also founded after World War II. These were the following: Department of State Veterinary Medicine (1946), Department of Food Hygiene (1949), Department of National Defence (1951–1957), Department of Physical Education (1950), Department of Veterinary Diagnostics (1952–1962), Russian Language Department (1949; from 1955: Department of Foreign Languages), Department of Botany (1953), Department of

Table 1

Training periods during the 200-year history of veterinary education in Hungary

Year	Period of training	Academic year	Language of instruction	Current name of the institution
1787	6 months (from February to July)		Latin and Hungarian	Department and Institute of Veterinary Medicine of the Medical Faculty, University in Pest (1787–1851)
1809	8 months		Latin and German; Hungarian and German	Department and Institute of Veterinary Medicine of the Medical Faculty, University in Pest (1787–1851
1827	12 months	1827/28		
1857	3 years	1857/58	Hungarian (and German)	Imperial and Royal (from 1861 Royal) Inst. of Veterinary Medicine in Pest (1851–1875)
1859	2 years	1859/60*		
1875	3 years	1875/76	Hungarian	Royal Hungarian Veterinary School (1875–1890)
1890	4 years	1890/91	Hungarian	Royal Hungarian Veterinary Academy (1890–1899) Royal Hungarian Veterinary College (1899–1933) Veterinary Division, Faculty of Agricultural and Veterinary Sci. (1934–1945)
1946	4.5 years	1946/47	Hungarian	Veterinary Faculty, Hung. University of Agricultural Sci. (1945–1952)
1951	5 years	1951/52	Hungarian	College of Veterinary Sci. (1952–1962) University of Veterinary Sci. (1962–

* Hungarian has been the official language of instruction since the 4th December 1860, and the sole official language since the academic year 1873/1874.

Marxism-Leninism (1953), Department of Animal Hygiene (1962), Department of Animal Nutrition (1963), Department of Agricultural Economics (1966).

An appreciable development of *laboratory facilities*, for the purpose of both training and research, has been in progress since the 'sixties.

The Helminthological Research Laboratory was founded in 1960, the Blood Group Laboratory in 1961, the Radioisotope Laboratory in 1964, the Electrocardiology Laboratory in 1970, the Electron Microscope Laboratory in 1971, the X-ray Laboratory also in 1971, and the Central Laboratory in 1986.

Training in *foreign languages* was prescribed for the veterinary undergraduates shortly after World War II, for the first time in the history of the school. The Russian language has been taught since 1949, and optional courses in other foreign languages (English, French, German, Latin) have been available

since 1954. A course in a second (optional) foreign language has been a compulsory requirement since 1962, and undergraduates not trained in Latin during their secondary education are required to attend a Latin course, too. Several subjects, which had originally been taught in optional courses, have been prescribed, such as agricultural economics and fish diseases from 1959 (optional from 1953), honey bee diseases from 1960 (optional since 1957), biochemistry, animal hygiene and farm management from 1954, darwinism from 1954 to 1971, pathophysiology, economics in livestock farming, labour safety and protection of the environment from 1972.

The *state exam system* was introduced into all Hungarian institutions of higher learning, including the veterinary school, in the academic year 1953/54. The final veterinary science students sat for a state exam for admission to the academic Degree of Veterinary Medicine for the first time in January 1954.

In addition to the new subjects integrated into the course of instruction, optional lectures and/or practicals in special aspects of veterinary science were available until the academic year 1965/66. Advancement of knowledge in the field of all veterinary disciplines has necessitated the demand for such courses ever since.

2. Veterinary medical training

The purpose of training is to provide such professionally cultured veterinarians who through proficiency in the theory and practice of veterinary medicine and related disciplines can cope with the various tasks in agriculture, animal breeding, animal health administration, food industry, professional training, research work and public health, moreover, who will be aware of new research results and who can adapt and develop them in the service of the population.

The curriculum of the currently only institution of veterinary higher learning in Hungary has been developed to satisfy the requirements of both undergraduate and postgraduate training. The five-year disciplinary—basic—training is followed by postgraduate to keep the graduates abreast with the rapid advances in knowledge in all branches of veterinary science, and with evolving new branches as well. The current postgraduate training system of the University covers refresher courses and courses for postgraduate specialization.

University Departments and Units in Charge of Professional Education

The professional training of the undergraduates is in charge of 19 Departments, three affiliated Clinics (of Medicine, of Obstetrics, of Surgery and Ophthalmology), one Outpatient Clinic, and the Foreign Languages Department.

Instruction is the responsibility of 109 teachers of different professional ranks (Professor, Reader, Senior Lecturer, Assistant Professor, Language Teacher, Sports Teacher) who are aided in their work by senior research workers, researchers, technicians and other staff, a total of 52 persons. Veterinary officers or scientists on the staff of other institutions, holding the title of Honorary Professor or Honorary Lecturer, also cooperate as invited lecturers in special topics.

Certain departments of the University, apart from the main discipline, cover the teaching or tutoring in one or other subjects not specified in the disciplinary programme, as follows:

DEPARTMENT	SUBJECT(S)
Chemistry	chemistry; medical physics
Anatomy and Histology	general and regional anatomy; embryology; cytology; histology
Physiology	animal physiology; biochemistry; radiobiology
Animal Husbandry	livestock production and breeding; genetics; biometry
Pharmacology	veterinary pharmacology and toxicology
Pathological Anatomy	general and special pathology; pathological diagnostics
General Zoology and Parasitology	general zoology; parasitology; tutors the courses in diseases of honey bees; fish pathology; diseases of wildlife
Medicine	veterinary clinical diagnostics; veterinary medicine; pathophysiology
Surgery and Ophthalmology	veterinary surgery; surgical techniques; veterinary ophthalmology; X-ray techniques; farrier's course
Obstetrics	veterinary obstetrics and gynecology; obstetrics and gynecological surgery; reproduction biology (including biotechnical aspects); udder diseases
Food Hygiene	meat hygiene; milk hygiene; food bacteriology
Animal Hygiene	animal hygiene; labour safety and protection of the environment
Epizootiology	epizootiology; virology; bacteriology; mycology; immunology
State Veterinary Medicine	veterinary administration; economics; forensic veterinary medicine; tutors a course in national defence, and another in the application of

	computer techniques in the animal health service
Agricultural Economics	economic aspects of food production
Marxism-Leninism	philosophy; political economy; scientific socialism; history of the Hungarian People's Republic and of the labour movement in Hungary; sociology

The departments in charge of teaching several subjects regularly invite guest lecturers from other universities or various veterinary institutions. The field courses are tutored by veterinary practitioners (farm veterinarians), veterinary officers and/or animal zootechnicians on the staff of large livestock production units, and are supervised by the competent University Departments.

The Training Scheme of the University

Undergraduate training extends over five academic years (10 terms), followed by a final two-month field course in the interim between the closing examinations and the state exam period. The language of instruction is Hungarian. The current training programme, valid since the academic year 1982/83, is shown in Table 2.

Instruction over 10 terms covers 37 compulsory subjects (38 for those undergraduates who had not studied Latin in secondary school). In addition to the prescribed courses, 25 to 30 optional courses (in professional topics and foreign languages) are offered every year. Attendance of these is at the discretion of the undergraduate, but two optional courses are prescribed for reporting and examination during the five-year training period.

Courses in the basic (pre-clinical) subjects are concluded at the end of the fourth term. Preclinical studies are followed by the *stricte sensu* professional subjects. The lectures given in the different subjects are linked to practical classes, demonstrations and/or seminars; the foreign language courses and physical education (gymnastics, swimming exercises, etc.) are integral parts of the training programme.

The course of instruction on a total prescribes 4700 hours during the 10 terms. Of the 4700 hours 2560 are devoted to lectures, 2020 to practical classes and demonstrations, and 120 to seminars. The percentual proportion of the hours devoted to theoretical (lectures, seminars) and practical instruction is 57 : 34. The working hours on average number 32 a week. In terms of weeks, the first to ninth terms last 15 weeks each, and the tenth term lasts 10 weeks (total: 145 weeks) (Tables 2 and 3). The prescribed field courses, attended between terms, cover an additional 19 weeks.

Table

Curriculum of the University of Veterinary Science (Budapest)

Serial No.	Discipline	Final ex.	Closing ex.	End-term ex.	Term perform. mark	Total hours of instruction	Lectures
		after term					
1	Philosophy	—	2	1	—	90	60
2	Political economy	4	—	3	—	120	60
3	Scientific socialism	—	6	5	—	60	30
4	History of the labour movement in Hungary	—	—	8	—	30	30
5	Optional topic of Marxism-Leninism	—	—	—	8	20	30
6	Foreign languages	—	3, 5, 8	—	1, 2, 3, 4, 5, 6, 7	5 10	—
7	Physical education	—	—	—	—	135	—
8	National defence	—	—	—	—	100	85
9	Chemistry	2	—	1	—	180	105
10	Medical physics	—	—	1	—	45	45
11	Zoology	—	—	1	—	30	30
12	Botany	—	—	2	—	60	30
13	Anatomy and Embryology	3	—	1, 6	2	270	120
14	Cytology and Histology	—	3	2	—	135	75
15	Biochemistry	4	—	—	3	142	590
16	Physiology	4	—	—	3	202	150
17	Biometry	—	—	3	—	15	15
18	Animal husbandry	5	—	3	4	165	105
19	Economics in food prod.	—	—	5	—	30	30
20	Pharmacology	6	—	—	5	135	75
21	Microbiology	6	—	—	5	150	90
22	Pathological anatomy	8	—	5	—	300	135
23	Pathophysiology	—	—	5	—	75	45
24	Parasitology	7	—	—	—	135	75
25	Animal nutrition	7	—	—	—	150	90
26	Medicine	9	—	6	7, 8	270	165
27	Fish and honey bee dis.	—	—	8	—	45	45
28	Toxicology	—	—	7	—	30	30
29	Surgery and Ophthalm.	9	—	7	—	225	105
30	Obstetrics and Repr. biol.	10	—	9	9	225	105
31	Food hygiene	10	—	—	9	175	115
32	Computer techniques in the animal health service	—	—	9	—	15	15
33	Forensic vet. med.	10	—	—	—	45	45
34	Labour safety, env. prot.	—	—	10	—	20	20
35	Animal hygiene	state exam			—	120	100
36	Epizootiology	state exam			—	160	140
37	State vet. med.; econ.	state exam			—	75	75
	Totals:	16	6	23	18	4700	2560
	No. of hours per week						

(valid since the academic year 1982/83)

Class practical	Seminars	Hours/week (lectures : practical)									
		1st year		2nd year		3rd year		4th year		5th year	
		1	2	3	4	5	6	7	8	9	10
		term no.									
		15	15	15	15	15	15	15	15	15	10
		weeks									
—	30	2 : 1	2 : 1	—	—	—	—	—	—	—	—
—	60	—	—	2 : 2	2 : 2	—	—	—	—	—	—
—	30	—	—	—	—	1 : 1	1 : 1	—	—	—	—
—	—	—	—	—	—	—	—	1 : 0	1 : 0	—	—
—	—	—	—	—	—	—	—	1 : 0	1 : 0	—	—
510	—	0 : 6	0 : 4	0 : 4	0 : 5	0 : 3	0 : 4	0 : 4	0 : 4	—	—
135	—	0 : 2	0 : 2	0 : 2	0 : 2	0 : 1	—	—	—	—	—
15	—	1 : 0	1 : 0	—	—	integrated into other subjects					
75	—	3 : 3	4 : 2	—	—	—	—	—	—	—	—
—	—	3 : 0	—	—	—	—	—	—	—	—	—
—	—	2 : 0	—	—	—	—	—	—	—	—	—
30	—	—	2 : 2	—	—	—	—	—	—	—	—
150	—	3 : 3	2 : 3	2 : 3	—	—	1 : 1	—	—	—	—
60	—	—	3 : 2	2 : 2	—	—	—	—	—	—	—
52.5	—	—	—	2 : 1	54 : 2	—	—	—	—	—	—
52.5	—	—	—	4 : 1	56 : 2	—	—	—	—	—	—
—	—	—	—	0 : 1	—	—	—	—	—	—	—
60	—	—	—	2 : 0	4 : 2	1 : 2	—	—	—	—	—
—	—	—	—	—	—	2 : 0	—	—	—	—	—
60	—	—	—	—	—	2 : 2	3 : 2	—	—	—	—
60	—	—	—	—	—	4 : 2	2 : 2	—	—	—	—
165	—	—	—	—	—	4 : 2	3 : 2	2 : 3	1 : 3	—	—
30	—	—	—	—	—	3 : 2	—	—	—	—	—
60	—	—	—	—	—	—	3 : 2	2 : 2	—	—	—
60	—	—	—	—	—	—	3 : 2	3 : 2	—	—	—
105	—	—	—	—	—	—	2 : 2	4 : 2	2 : 2	3 : 1	—
—	—	—	—	—	—	—	—	—	3 : 0	—	—
—	—	—	—	—	—	—	—	2 : 0	—	—	—
120	—	—	—	—	—	—	—	2 : 2	3 : 3	2 : 3	—
120	—	—	—	—	—	—	—	—	2 : 3	3 : 3	3 : 3
60	—	—	—	—	—	—	—	—	3 : 2	2 : 2	4 : 0
—	—	—	—	—	—	—	—	—	—	1 : 0	—
—	—	—	a —	—	—	—	—	—	—	1 : 0	3 : 0
—	—	—	—	—	—	—	—	—	—	—	2 : 0
20	—	—	—	—	—	—	—	—	—	4 : 0	4 : 2
20	—	—	—	—	—	—	—	—	—	6 : 0	5 : 2
—	—	—	—	—	—	—	—	—	—	3 : 0	3 : 0
2020	120	14 : 15	14 : 16	14 : 17	16 : 15	17 : 15	17 : 19	17 : 15	16 : 17	25 : 9	24 : 7
—	—	29	30	31	31	32	36	32	33	34	31

Table 3

The five-year course of instruction in weeks

Year of study	Terms (spring + autumn)	Exam period	External (field) practicals	Total training	Vacation
1st	30	10	—	40	12
2nd	30	10	2	42	10
3rd	30	10	2	42	10
4th	30	10	4	44	8
5th	25	10	11	46	6
Totals	145	50	19	214	46
	4700 hours		760 hours		
	5460 hours				

The autumn and spring terms equally last 15 weeks in each academic year except the fifth one, in which the spring term (10th term) lasts only 10 weeks, to allow for completion of the 8-week final field course before the state exams. The autumn term begins early in September, with a ceremonial opening of the academic year at which the first-year students take their oath of allegiance. The spring term begins early in February. Each term is followed by a five-week exam period.

During the five-year training period 23 end-term and 16 final examinations are prescribed for the undergraduates. The lecturer or tutor grades performance (awards a "practical mark") at the conclusion of teaching of each subject. In courses of physical education, attendance is certified without evaluation of performance.

The undergraduate training programme includes no evening course system. The seat of the school and its teaching activities are in Budapest.

Entrance requirements

All men and women 18–35 years old, of impeccable conduct, who hold a medical health certificate, and a matriculation certificate from a high school or an equivalent, are entitled to apply for admission to the University, and are eligible for admission if they satisfy the examiners (obtain the prescribed number of performance scores) at the entrance examination. This examination comprises written and oral tests. The written tests are devised, controlled and evaluated by a ministerial board under a central (national) scheme, the oral tests are handled by a board of 5–6 examiners assigned by the University. The main topics of the written and oral tests are aspects of chemistry and biology, based on the knowledge acquired in these fields in the secondary school. Candidates of other than grammar school education at the secondary school level (e.g. those having attended a secondary school for agriculture) can, instead

of chemistry, choose some other subject from a list of prescribed topics, subject in which they are better versed.

Performance at the entrance examination is evaluated by scores, and a commission presided by the Rector of the University decides on admission under consideration of the quota set by the Ministry. The current quota is 90 (for applicants of Hungarian nationality). In recent years, applications for admission have exceeded the quota about five times. Among the first students about 15–18 per cent are women, and about 9–12 per cent are of foreign nationality.

The foreign applicants sit for a special entrance examination in biology and chemistry, and are also examined for knowledge of Hungarian, the language of instruction (pre-entry courses in Hungarian are available for foreign candidates). Those foreign students, who meet the expenses of training from their own financial resources, i.e. those not holding a fellowship or grant, sit only for the language examination by special permission of the Ministry of Education. No limitations are set to the quota of foreign students.

Theoretical instruction

This is based mainly on the lectures and seminars, but the practical courses also offer possibilities for discussion of the theoretical aspects. The lectures are attended by the entire year, whereas seminars are held for small groups of students (10–15 in a group). The courses in philosophy, political economy and scientific socialism are based entirely on the seminar system, which facilitates the free exchange of ideas by a less formal contact between teacher and students.

Practical training

This is conducted during terms for small undergraduate groups, and between terms in field courses.

Practical classes during terms

(a) *Internal* practicals held in the university campus cover on a total 2020 hours during the 10 terms, in the following fields:

— class practicals,
— attendance in the Outpatient Clinic (from the sixth term on).
— attendance in the University Clinics (from the seventh term on).

— morning attendance in the University Clinics (from the seventh term on).

(b) *External* disciplinary practicals, organized outside the campus in veterinary institutions and large-scale farming units, cover on a total 34 days (272 hours), in the following fields:

— practicals in an animal hospital (5 days each in the seventh, eigth and ninth terms, on a total 15 days),
— practicals in institutions affiliated to the national animal health service (two days each in the eighth and ninth term, on a total 4 days),
— occasional visits to large-scale livestock production units (three days each in the sixth to tenth terms, on a total 15 days).

Scheme of practicals between terms

Discipline	Term	Duration (weeks)
Animal Husbandry	4th	2
Animal Nutrition	6th	2
Therapeutic (Clinical)	8th	4
Food Hygiene	9th	3
Laboratory Diagnostics	10th	3
Farm Veterinary Practice	10th	3
Veterinary Administration	10th	2
Total: (95 days = 760 hours)		19

The percentual proportion of hours devoted to lectures and practicals in the course of instruction is 57 : 43, if only the internal (campus) practicals are taken into consideration, and 46 : 54, if all hours spent in practical training during and between terms are calculated. The total training period, including the 19 weeks of between-term practical courses, covers 5460 hours (Table 3).

The *internal disciplinary practicals* are held for groups of 10–15 students, with a tutor. The objective of this training form is, apart from improving the manual skill of the undergraduates, to acquaint them with routine veterinary diagnostics, clinical and pathological techniques, and for better comprehension of the information conveyed by lectures. Work in various fields of veterinary medicine promotes the understanding of interrelationships between theory and practice, and helps to acquire a scientifically founded professional outlook. The undergraduates are also trained in preparing hospital and autopsy records, veterinary certificates, expert testimonies, etc. The group training system is of primary importance from the educational point of view, and attendance and assistance in the University Clinics furnish invaluable personal experience in various aspects of the chosen profession.

Performance in practicals is evaluated by a special mark (see Table 2) at the end of respective terms; in some subjects only the attendance is certified.

External disciplinary training is, during terms, based on visits to large livestock farming units, food industry plants, various veterinary institutions, and on self-training in veterinary diagnostic work. The undergraduate study groups are accompanied by their tutor in the University's bus to a local veterinary practice or county veterinary station, where they are tutored through a practitioner's or a veterinary officer's work-day, and participate actively in clinical or whatever other veterinary work occurs (autopsies, surgeries, mass interventions in flocks or herds, such as blood sampling and vaccination as well as in activities of the animal health and food hygiene control service).

In the *field courses* held between terms generally one or two students are assigned to one tutor. Courses in livestock production and nutrition are held in large livestock farming units, courses in veterinary practice are either held by a district veterinarian, or are, partly or fully, spent in an animal hospital. During their attendance in the veterinary practice or animal hospital the undergraduates are obliged to perform, first with the assistance of the tutor, then independently, various clinical, surgical or obstetrical treatments and interventions met with during a routine work-day. Practicals in food hygiene cover two weeks in an abattoir and one week in the animal food hygiene service controlling the hygienic conditions of food production and trade, and are tutored by veterinarians working in dairy plants or in laboratories of the County Veterinary and Food Hygiene Control Stations.

In the interim period between the end-term examinations following the 10th term and the state examination, i.e. in possession of the total material of instruction comprised in the training programme, the final-year students attend a complex field course. This begins with practical instruction in a veterinary diagnostic institute with a broad scope of activities. Here the pre-graduates gain experience in the pathological, pathohistological, bacteriological, virological, parasitological and toxicological methods of disease identification in domestic and wild mammals and birds, fishes and honey bees, and in possible approaches to the eradication of certain infectious diseases from flocks and herds.

The pre-graduate is then assigned to a large livestock farming unit (livestock production enterprise, state farm or collective farm) under tuition of the farm veterinarians, with special regard to factors influencing the quality and quantity of products of animal origin. Here the students are introduced to different large management systems, management problems of livestock farming, methods of disinfection and infectious (contagious) disease prevention, applications of data processing in intensive livestock farming, methods furnishing labour safety and protection of the environment in (and around) intensive livestock farming units, and the impact of these on the responsibilities of the farm veterinarian.

Finally the pre-graduates are acquainted with those levels of veterinary administration, which form part of the veterinary practitioner's duties and the

organizational administrative aspects of the profession. Special attention is devoted to the training by a higher veterinary officer (usually the District Chief Veterinarian) in compiling veterinary reports, and in administrative and organizational measures concerning disease eradication, livestock transportation, carcase disposal, meat inspection, and expert testimony.

The programme schedules of the external practicals are elaborated in full detail by the competent University Departments, separately for the undergraduates and their tutors. More than 300—mainly veterinary—specialists collaborate per annum in the practical training of second- to fifth-year veterinary students.

The undergraduates are obliged to keep a diary on each of the above outlined seven external courses. The diaries are evaluated by the University Department in charge of the course, and after consultation with the tutor, are scored from 1 to 5. These scores are taken into consideration for statistical evaluation of the mean performance. It should be pointed out that the external courses are always held after conclusion of a term, and examinations follow either after the next term or immediately after the field course. The veterinary or other specialists serving as tutors of external practicals are always recruited from non-university staff, but the organization and supervision of an external course is always the joint responsibility of the University Department in charge of the respective discipline and the Office of Studies. External practicals are attended in various parts of the country, with the assistance of selected state farms, collective farms, County Veterinary and Food Hygiene Control Stations, regional Veterinary Institutes, etc.

Training conditions and facilities

All lectures are held in the lecture rooms located at the university campus (Budapest, VII, Bethlen Gábor u.). Practical training is also conducted in buildings located outside the campus (Dept. of Epizootiology, Budapest XIV., Hungária krt. 23–25; Laboratory Units, Budapest VII., Rottenbiller u. 50).

Seven large lecture rooms (each seating 100–120), are available for lectures for the entire class, and five smaller for groups of 10–15, are available for seminars and foreign language courses. A well-equipped audio-visual laboratory is a teaching-aid for foreign language lessons.

All lecture rooms have recently been renovated and provided with up-dated technical equipment (TV-sets, video-cameras, etc.). Demonstration material used during lectures, i.e. slides, films, preparations and sick animals, is available to the lecturers of the different departments.

Well-equipped demonstration rooms, laboratories, surgical and autopsy rooms are available for practicals, with particularly up-dated facilities for

histological, pathohistological, animal hygiene, obstetric, food hygiene, parasitological and microbiological diagnostic and laboratory work.

Two large trucks on seven-days-a-week service, transport sick animals for the clinical studies, and two small trucks are used to collect carcases and abattoir material. Two buses transport the undergraduates to practicals outside the campus and to farms or plants, for occasional class visits.

Several museums established in the university campus, above all the more than 100-year old invaluable collections of the Departments of Anatomy and Pathological Anatomy, are available for purposes of instruction. Veterinary art can be practised in various laboratories, autopsy rooms and in the three university clinics.

A wide range of textbooks and manuals (in Hungarian) assists the undergraduates in mastering professional knowledge. From 1945 to 1985, the lecturers of the University wrote a total of 61 textbooks and manuals, and issued material for most courses to cover newer advances in the discipline. The slides, films and other demonstration materials are usually prepared by the teachers themselves, with the assistance of the Central Photography Laboratory and the Office of Studies Technology.

The Central Library provides the undergraduates with literature for studies and for preparing reports and theses, and offers instruction in the use of libraries, and bibliographical data collection and processing.

System of examinations

Admission to the next term is subject to passing the examinations prescribed in the curriculum (see Table 3), and to completing the compulsory external practicals within the five-week exam period following each term. The prescribed end-term exams number six or less in each exam period. Admission to examinations is subject to payment of the tuition fee, and to certification by the competent teacher that all obligations prescribed in the examination subject have been observed. The oral examinations are public, and are based on random selection of envelops containing questions. The final examinations and re-examinations are sat in the presence of two teachers only. Exam performance is evaluated by five grades (marks), such as outstanding (5), good (4), satisfactory (3), pass (2), fail (1).

Mean performance is evaluated and entered into the study record at the end of each term, in terms of percentages based on the five scores (5.00 = outstanding; 4.51–4.99 = good; 3.51–4.50 = above-average; 2.51–3.50 = average; 2.00–2.50 = pass; <2.00 = fail). The grades allotted for performance at end-term and closing examinations are weighted (doubled) for calculation of the average performance.

Four types of examinations are prescribed, as follows:

(a) Oral or written *reporting* is required on a minor subject usually taught for one term. The report is evaluated either by one to five grade, or simply by "pass" or "fail" mark.

(b) *End-term examination* is by oral, oral + written or other test in a subject taught for one term or longer; the performance is evaluated by one to five grades.

(c) *Closing examination* follows the conclusion of instruction taught for one or more terms, and is based on an oral or oral + written (or other) test. The undergraduate is thereby not reexamined in details already reported at end-term examination(s), only in the interrelationships of these with the newly acquired knowledge. Evaluation is by one to five grades.

(d) *Final examination* summarizes all aspects of a subject taught for several terms, by oral, oral + written (or other) tests; performance is evaluated from one to five grades.

Evaluation of undergraduate *performance during terms* is based on the quality of individual contributions along prescribed lines of work (written tests or papers, laboratory work, clinical (hospital) and autopsy records, diaries, activity shown in attendance of practicals and seminars, etc.). Qualification is from one to five grades or, exceptionally, by "pass" or "fail" mark. The examination results are entered by the Head of the Department (or the teacher in charge of the examination) into the undergraduate's study record and into the examination records, which are signed by all examiners. The performance scores are finally entered into the registry kept in the Office of Studies.

The state examination

Obtaining the degree of Doctor of Veterinary Medicine is subject to satisfying the board of examiners at the state examination. Those pre-graduates are admitted to the state examinations who have completed all courses prescribed in the training programme, including external practicals, have satisfied the examiners at all examinations and hold, consequently, a *final certificate of study* (absolutorium). The state examination comprises submission of a written thesis (dissertation) based on independent professional work carried out during the period of training, and a viva voce report to a board of examiners. Topics for the dissertation are proposed by the university departments, and a tutor is assigned to assist the pre-graduate in compiling the thesis, and to secure the assistance of other institutions, farm managers or veterinary practitioners, if required. The pre-graduate is obliged to begin elaboration of this thesis during the ninth term at the latest (topics for the dissertation may also be developed from independent research work under the auspices of the Undergraduate

Scientists' Club). The dissertation is revised and judged by the Head of the Department in charge of tutoring, and is submitted for evaluation (by one to five grades) to the board of examiners. The oral part of the state exam is based essentially on three disciplines (state veterinary medicine and economics; animal hygiene; epizootiology), but it comprises the main aspects of other disciplines, such as food hygiene, pathology, pathophysiology, pharmacology, clinical sciences etc. The viva voce part of the state exam is therefore a complex oral test in general professional knowledge.

The board of examiners consists of a chairman and 3–6 board members, one of whom is always a representative of the University's higher authority, the Ministry of Agriculture and Food. The other members are professors or readers of the University and/or leading veterinary officers of the animal health service or the veterinary institutions. The board members are assigned by the Rector of the University, the Chairman by the Ministry of Agriculture and Food. Performance at the state examination is evaluated by calculating the arithmetic mean of the sum of scores in the three main subjects and for the dissertation, as follows:

Mean scores: 4.51–5.00 excellent
3.51–4.50 good
2.51–3.50 average
>2.51 pass

The result is "fail" if the candidate failed to satisfy the examiners in one or more subjects or with his dissertation.

The candidates are obliged to sit for the state exam within 3 years of completion of training (absolutorium). Those candidates who failed to satisfy the board of examiners in the first turn can sit for a deferred examination on not more than two occasions.

3. The "Doctor of Veterinary Medicine" degree

Those candidates who have satisfied the board of examiners at the state examination receive a graduation certificate—a diploma certifying the Doctor of Veterinary Medicine degree—in Hungarian and Latin. The diploma is presented by the Rector under traditional ceremonial circumstances. Graduates holding this diploma are entitled to use the title of Doctor of Veterinary Medicine (not to be confused with the higher postgraduate degree "Doctor of Veterinary Science"). Information on the number of diplomas awarded in the period 1900–1985 is presented in Table 4.

Table 4

Number of graduation certificates issued by the University of Veterinary Science (or its legal predecessors) (1900–1965; 1970–1985)

Year	No. of graduates			
	Men	Women	Total (Hungarian citizens)	Foreign citizens
1900	—	—	45	—
1910	—	—	70	—
1920	—	—	25	—
1930	—	—	47	—
1940	—	—	68	—
1945	—	—	18	—
1950	—	—	73	—
1955	—	—	131	—
1960	—	—	142	—
1965	—	—	133	—
1970	99	13	112	5
1971	80	12	92	2
1972	77	14	91	2
1973	72	12	84	3
1974	74	13	87	6
1975	81	18	99	19
1976	79	9	88	9
1977	94	15	109	9
1978	78	25	103	10
1979	97	23	120	8
1980	85	13	98	13
1981	76	15	91	7
1982	90	15	105	3
1983	66	19	85	10
1984	99	15	114	14
1985	89	13	102	8

The degree is awarded at three levels, depending on mean performance calculated from all scores allotted for closing and final examinations during the period of study and for the state examination, as follows:

"summa cum laude"	4.51–5.00
"cum laude"	3.51–4.50
"rite"	2.00–3.50

A *degree of distinction* (red diploma) is awarded to the candidate, who has passed the state examination with outstanding (5.00) qualification, submitted a dissertation also qualified as outstanding, passed all final examinations at the highest level (5.00), and performed at all other prescribed examinations and in any prescribed duties not lower than 3.51.

The candidate who performed excellently (5.00) in all subjects throughout his or her secondary school plus university training, and showed meanwhile an exemplary conduct, may be, on instigation of the University, awarded a degree of merit (promotio sub auspiciis rei publicae popularis) by the Presidential

Board of the Hungarian People's Republic. This degree is awarded during a ceremonial session which is attended by the President of the Republic, and is certified by a special diploma. The awardee is presented a golden ring decorated with the coat-of-arms of the Hungarian People's Republic. Since 1945, three graduates of the University have been awarded this distinguished degree of merit.

Veterinary graduates gain employment by application for vacancies advertised, so that they can start their professional career immediately after receiving their diploma.

The *title of "Doctor Medicus Veterinarius Universitatis"* as at other universities can also be obtained.

4. Financial support and premia available to undergraduates

(a) A *study grant* may be general, outstanding or state.

A *general studentship* is allotted, from the second term on, for 10 months of the calendar year to each undergraduate whose average performance is 3.00 or higher.

An *outstanding study grant* is on application tenable for one term to each undergraduate, whose average performance is 4.50 or higher during the preceeding term.

The general and the outstanding study grants are allotted on recommendation of the Studentship Committee, formed by fellow students and the teacher(s) in charge of the class, are revised by the Student Welfare Commission, and are approved by the Deputy Rector for Studies.

A *State grant*, more precisely a studentship of the Hungarian People's Republic is, on recommendation of the University and on personal application, allotted by the Ministry of Agriculture and Food to those students of the second to fifth year who in both terms of the preceeding academic year achieved an average performance of 4.50 or higher, and have distinguished themselves by exemplary conduct and social activities for the benefit of the students' community. On average 8 to 12 undergraduates have held a state studentship per annum, of Ft 2000 per month.

(b) *Social support* is extended to undergraduates in need of it, either as a regular or extraordinary financial support, or in the form of other benefits.

Financial support is provided at four levels, depending on the per capita monthly income of the family (social categories I–IV).

An *extraordinary support*, in the form of money or other benefits, is extended occasionally to undergraduates in need of it for special circumstances.

Non-financial benefit is provided by charging reduced prices for board and lodging (in the canteen and student hostel run by the University).

Student applications for social support, with a certificate of the family income enclosed, are adjudged by the Studentship Committee, revised by the Student Welfare Committee, and approved by the Deputy Rector for Studies.

(c) *Special support for the period of practical courses*

Undergraduates assigned to prescribed field courses are entitled to special financial support and an *increased studentship allowance* for the period. For practicals attended outside the Capital, the *travel costs* are also *refunded.* (Holders of a student's certificate are entitled to a 50 per cent reduction in railway fares.)

(d) *Premia for individual or group performance*

From the second term of the first academic year on until the end of the ninth term, premia may be bestowed on several occasions during and between terms on deserving single students or student groups, to reward special performance in studies or in other fields.

(e) *Grants or studentships bestowed by non-university organizations*

The veterinary undergraduate is entitled to conclude a *study contract* with an agricultural cooperative, state farm, state enterprise, etc. to the effect of obligation to join the latter's staff for a predetermined time after graduation, against a financial support or studentship while he is studying for the DVM degree. Eligible for a study contract are undergraduates with mean performance scores not lower than 2.51.

(f) *Tuition fee*

Payment of a tuition fee is due from the first term of the second academic year (third term) on. Exempted from paying are those undergraduates who have average performance grades of 3.51–5.00, those with lower performance pay Ft 100 to 1500, depending on the income of the supporting family. The tuition fee is US $ 1500 per term for undergraduates of foreign nationality.

5. University committees assisting professional and general education

Committees

Four permanent committees or commissions assist the educational work, such as the Committee for Professional and General Education, the Student Welfare Commission, the Committee for Cultural Education and the Class

Warden Groups of Teachers. These Committees elaborate proposals and recommendations for development of the training schemes, handle matters of student welfare, and organize cultural programmes for the undergraduates. The committee members are recruited from the ranks of university professors and readers, of directors or deputy directors of veterinary institutions, and from among the undergraduates. The Class Warden Groups (formed by 4–5 teachers for each class) maintain close personal contact with the undergraduates and serve as mediators of teaching and educational problems between the students and the University Council.

The Student Hostel

The University's Student Hostel, named after the world-famous Hungarian veterinary scientist, J. Marek, was built in 1973 (Budapest, XIV, Mogyoródi u. 59–64). Formerly only minor dormitories, managing a limited number of undergraduates, were affiliated to the University. The present student hostel, a three-storey building, offers accommodation for 261 students in 87 rooms. Additional rooms are reserved for veterinarians attending postgraduate courses and for guests of the University.

Each room (except some guest rooms) is a study-bedroom for three persons, with an anteroom for the wardrobes, a bathroom, a toilet and a balcony. Common rooms (aula, public sitting room, lecture room, study rooms, sports rooms, kitchens, laundry room) are available for the use of all hostel residents.

The warden of the student hostel is appointed by the Rector and is assisted in his work by a committee of four lecturers of the University, also serving as education officers. The affairs of the resident undergraduate community are handled autonomously by students, in charge of executing the decisions of the general assembly of residents. In the interim between general assemblies, the affairs are conducted by the student hall committee elected by the general assembly with the participation of the warden, the education officers, an undergraduate secretary and several students. More than 50 per cent of the veterinary undergraduates reside in the student hostel.

POSTGRADUATE (REFRESHER AND SPECIALIST) TRAINING IN THE UNIVERSITY OF VETERINARY SCIENCE

Gy. LAMI, Deputy Rector

In Hungary, the intensive development of food production has long presupposed the need for postgraduate refreshment and extension in various aspects of livestock production, and animal disease control to reinforce the knowledge and skills acquired by veterinarians at the undergraduate training level. To keep veterinary practitioners and officers abreast with newest developments in their chosen field and related sciences, and with the application of these in their everyday work, a postgraduate training system has been developed under the auspices of the University of Veterinary Science.

1. Postgraduate refresher courses

Before 1945, there had been, apart from the courses initiated by Hutÿra (see page 31), no systematic, regular postgraduate training available for veterinarians although the conferences held by the *Hungarian Veterinary Association* were partly a refreshing of the professional knowledge. After World War II, first the *Trade Union of Veterinarians*, then, between 1950 and 1955, Veterinary Sections of other Trade Unions took charge of organizing refresher courses for veterinary graduates. These courses soon became very popular among the veterinary practitioners, and the professors (teachers) invited to give lectures regarded this assignment as a honour. An essential change in the system of postgraduate training followed in 1955, when a statute of the Ministry of Agriculture proclaimed *veterinary postgraduate education* a state task and referred the organization of the courses and elaboration of the teaching programmes to the competence of the College of Veterinary Science. Organized training was initially conducted in two forms, at conferences arranged in each county by the local veterinary administration, and in centrally organized courses held at the University. From 1970, with the beginning of long-term courses for postgraduate specialization, the county conferences were referred to the competence of the *Society of Hungarian Veterinarians* (affiliated to the Hungarian Agricultural Association).

The development of large scale livestock units confronted the veterinarians with new animal health problems. Mass incidence of disease in the large herds and flocks raised the demand for a new over-all attitude in animal health and for veterinary specialization in various fields. The so-called *central* specialist training scheme, developed to cope with this demand, was based on 2–3 week resident *courses* and altered not only the structure, but also the contents of postgraduate education.

The main objective was to adapt the topics of the refresher courses to economic trends. Training programmes for specialization courses have been organized on (1) disciplinary, (2) animal species-related or (3) other basis.

(1) The content of the disciplinary courses was compiled from selected topics of one or two related subjects, for example "general aspects of animal hygiene and livestock nutrition", "current trends in protection of the environment", "current trends in reproduction biology", "veterinary toxicology", "control of parasitoses", "administrative, organizational and laboratory aspects of food hygiene", etc.

(2) Problems arising in units specialized for the intensive production of a single *species* of livestock have been the topic of several refresher courses dealing with various aspects of health and disease in poultry, pigs, cattle, sheep, fur animals, or bred fishes.

Teaching in both type (1) and type (2) courses has been centered on the practical rather than theoretical aspects of disease prevention by a complex approach, including, in addition to strictly professional information, related aspects of livestock husbandry and nutrition, economics, jurisdiction, farm management, and technology.

(3) Refresher courses on topics *other* than disciplinary or species-related have been held for veterinarians engaged in special administrative and mana-

Table 1

Number and distribution of veterinarians attending refresher courses per annum

Year	No. of participants
1970	191
1971	317
1972	194
1974	91
1975	58
1977	251
1979	238
1980	138
1981	139
1982	405
1983	228
1984	174
1985	298
Total	2722

gerial tasks, whose importance for the profession has been incomparably greater than the relatively low number of officers in charge of them. This category covers the courses held for experts in forensic veterinary medicine, and for veterinarians acting as teachers in species-oriented animal production technical training (at secondary professional schools), or serving as tutors of practical courses for veterinary undergraduates. These courses last for 1–3 weeks (usually 2 weeks) and their programme covers lectures, demonstrations and/or practicals in 30 hours a week, including individual or group consultations.

The numbers of veterinarians having attended refresher courses of different types, in the period 1970–1985, are shown in Table 1.

2. Courses for postgraduate specialization

Courses leading to postgraduate specialization certified by a diploma were launched for the first time in the 1970–1971 academic year.

The preparations for the development of specialist training had lasted several years, owing to lack of traditions and experience in advanced postgraduate education at this University. First and foremost the *lines of specialization* and the *target numbers* for each line had to be established under consideration of estimated nation-wide demands for specialists.

General didactic principles

Essentially two main didactic principles have been observed in compiling the curricula for the specialist courses. The first principle is to integrate the undergraduate and postgraduate training schemes into an undivided process of learning. Thus the two training programmes have many similar features. The undergraduates are trained to have a dynamic professional outlook enabling them to comprehend and creatively utilize advances in their chosen field, and at the same time they are provided with sufficient "static" knowledge in the theoretical and practical aspects of their profession, so that they will be able to carry out their duties with confidence from the very beginning of their work.

On this didactic principle is based the training scheme for postgraduate specialization, with the difference that the full knowledge of the content of undergraduate training is presupposed, and more emphasis is laid on the dynamic approach to the profession. The veterinary specialists should be able to apply directly up-to-date specialized knowledge in their practical work, the main objective of advanced training being to reinforce an *inter-disciplinary outlook* in the general biological and economic sense.

Fields, training scheme and disciplinary programmes of postgraduate specialization

Considering the above-mentioned principles, an agreement has been made with respective Departments of the Ministry of Agriculture and Food, by which fields of veterinary specialization have been selected according to the structure and trends in the national livestock production and taking also into consideration that small-scale, private livestock keeping is being integrated with large-scale units.

The fields offered for postgraduate specialization and the number of veterinarians awarded a specialist diploma in the period 1972–1986 are shown in Table 11.

Training in each field of specialization generally furnishes complex instructions in relevant topics of livestock production, nutrition, farm management, economics, technology, veterinary administration and forensic veterinary medicine, as, well as, occasionally, ecology. The proportion of the main topics varies with the field of specialization.

(a) Course in poultry health

The curriculum for this course was quite easily developed (Table 2), because the content and proportion of topics to be included had been developed during the more than 10-year activities of the *Poultry Health Section of the*

Table 2

Curriculum: Course for specialization in poultry health

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics; farm management	20	20	—	20	—	—	—	—	—	—	—	1/end-term
Toxicology	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Physiology-pathophysiology	18	18	—	8	—	10	—	—	—	—	—	2/final ex.
Poultry husbandry	15	15	—	5	—	10	—	—	—	—	—	2/final ex.
State vet. med. and forensic vet. med.	10	10	—	—	—	—	—	10	—	—	—	3/final ex.
Parasitology	12	10	2	—	—	—	—	10	2	—	—	3/end-term
Food hygiene	10	10	—	—	—	—	—	10	—	—	—	3/end-term
Pathology	30	18	12	3	3	3	3	2	3	10	3	4/final ex.
Poultry nutrition and metabolic diseases	30	30	—	—	—	8	—	6	—	16	—	4/final
Epizootiology	25	35	—	10	—	5	—	5	—	15	—	state exam
Animal hygiene	30	30	—	—	—	10	—	5	—	10	—	state exam
Visits to farms	20	20	—	—	—	—	10	—	10	—	—	—
Totals	240	206	34	56	3	46	13	48	15	56	3	
				59		59		63		59		

L = lectures; P = practicals

Society of Hungarian Veterinarians, whose conferences and consultations held on topics related to poultry production attracted many veterinary scientists and practitioners engaged in the field. Another factor facilitating development of the curriculum was the circumstance that in Hungary *intensive management systems* in the livestock industry were established for the first time in poultry production.

(b) Course in pig health

Since the initiation of the course leading to specialization in pig health had coincided with the beginning of large-scale pig farming, the development of an appropriate curriculum raised more problems than in the case of the poultry course. Certain details of the curriculum had to be expanded or adapted to current needs during the course periods (Table 3).

(c) Course in cattle health

Demand for cattle health specialists (Table 4) arose with the issue of governmental regulations for improvement of the national cattle production scheme. Changing trends in this branch of livestock production have, from the beginning, necessitated adaptation of the training programme to current needs during courses.

Table 3

Curriculum: Course for specialization in pig health

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Regional anatomy	10	6	4	6	4	—	—	—	—	—	—	1/end-term
Parasitology	10	8	2	8	2	—	—	—	—	—	—	1/end-term
Physiology-pathophysiology	12	12	—	6	—	6	—	—	—	—	—	2/final ex.
Pig husbandry	14	14	—	8	—	6	—	—	—	—	—	2/final ex.
Reproduction biology and obstetrics	12	12	—	6	—	6	—	—	—	—	—	2/end-term
Medicine	12	12	—	—	—	6	—	6	—	—	—	3/end-term
Pharmacology-toxicology	15	15	—	—	—	10	—	5	—	—	—	3/final ex.
Food hygiene	16	10	6	—	—	4	3	6	3	—	—	3/final ex.
Pathology	32	18	14	—	2*	2	4	8	4	8	—	state exam
State vet. med.	12	12	—	—	—	—	—	6	—	6	—	4/final exam
Epizootiology	40	36	4	4	—	8	—	10	—	14	4	state exam
Pig nutrition	25	19	6	4	2	4	2	5	2	6	—	4/final ex.
Animal hygiene	26	22	4	—	—	—	—	8	—	14	4	state exam
Demonstrations	13	—	13	—	—	—	5	—	2	—	6	
Totals	259	206	53	52	10	52	14	54	11	48	18	
				62		66		65		68		

* practice in electron microscopic examination
L = lectures; P = practicals

Table 4

Curriculum: Course for specialization in cattle health

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Principles of economics and breeding policy	12	12	—	8	—	—	—	2	—	2	—	1/end-term
Physiology	14	14	—	10	—	4	—	—	—	—	—	2/final ex.
Anatomy	6	6	—	6	—	—	—	—	—	—	—	1/end-term
Cattle husbandry	16	16	—	16	—	—	—	—	—	—	—	1/final ex.
Obstetrics and reproduction biology	28	17	11	—	—	17	11	—	—	—	—	2/final ex.
Building construction and hygienic engineering (1) technical systems (2)	20	20	—	6	—	6	—	4	—	4	—	2/end-term(1) final ex.(2)
Farm management	14	14	—	—	—	6	—	8	—	—	—	3/end-term
Cattle nutrition	24	24	—	6	—	6	—	6	—	6	—	state exam
Medicine	18	16	2	—	—	—	—	8	—	8	2	4/final ex.
Surgery	10	6	4	—	—	6	4	—	—	—	—	2/end-term
Parasitology	10	8	2	—	—	—	—	—	—	8	2	4/end-term
Pharmacology	8	8	—	—	—	—	—	8	—	—	—	3/end-term
Pathology	16	11	5	3	1	3	1	3	1	2	2	4/final ex.
Epizootiology	36	36	—	8	—	6	—	8	—	14	—	state exam
Animal hygiene	28	28	—	6	—	6	—	8	—	8	—	state exam
State and forensic vet. med.	16	16	—	—	—	—	—	—	—	16	—	state exam
Food hygiene	15	14	1	—	—	—	—	14	1	—	—	3/end-term
Totals	291	266	25	69	1	60	16	69	2	68	6	
				70		76		71		74		

Table 5

Curriculum: Course for specialization in animal hygiene

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics in food husbandry	14	14	—	14	—	—	—	—	—	—	—	1/end-term
Management and organization	14	14	—	14	—	—	—	—	—	—	—	1/end-term
Animal husbandry	16	16	—	8	—	8	—	—	—	—	—	2/final ex.
Physiology-phatho-physiology	18	18	—	8	—	10	—	—	—	—	—	2/final ex.
Toxicology	10	10	—	—	—	10	—	—	—	—	—	2/end-term
Reproduction biology	12	12	—	—	—	7	—	5	—	—	—	3/end-term
State vet. med.	12	12	—	—	—	—	—	12	—	—	—	3/final ex.
Control of infectious diseases	18	18	—	—	—	—	—	8	—	10	—	4/final ex.
Technicals	30	30	—	—	—	—	—	14	—	16	—	state exam
Animal nutrition	32	32	—	—	—	10	—	8	—	14	—	state exam
Animal hygiene	50	40	10	8	2	10	2	8	2	14	4	state exam
Farm and other excursions	20	—	20	—	5	—	5	—	5	—	5	
Totals	246	216	30	52	7	55	7	55	7	54	9	
				59		62		62		63		

L = lectures; P = practicals

(d) Course in animal hygiene

The programme of this course (Table 5) has been centered on optimization of the conditions of management and feeding with regard to the physiological needs of animals and poultry under large management systems, to ensure *health and even performance*. Thus, in contrast to the disease-oriented outlook prevailing in the contents of animal and poultry health specialist courses, the approach of animal hygiene to health problems is essentially *environment-oriented*, to enable the trainees to elaborate *recommendations for the improvement of livestock health and performance*, on the basis of objective measurement of environmental parameters and by a comprehensive knowledge of all related aspects.

(e) Course in food hygiene

The veterinary food hygiene specialists (Table 6), with their professional activity, are expected to contribute to *improving the quality, and increasing the supply of foods of animal origin*, to assist in *food exportation*, and to cooperate in the *prevention of health hazards to humans*. The training programme, there-

Table 6

Curriculum: Course for specialization in food hygiene

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics in food production and trade	10	10	—	10	—	—	—	—	—	—	—	1/end-term
General aspects of state vet. med.	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Environmental hygiene	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Food biochemistry	18	18	—	10	—	8	—	—	—	—	—	2/final ex.
Zoonoses	14	14	—	—	—	14	—	—	—	—	—	2/end-term
Food microbiology	28	28	—	6	—	10	—	12	—	—	—	3/final ex.
Dairy hygiene	18	18	—	—	—	8	—	10	—	—	—	3/end-term
Hygienic aspects of food processing techniques	40	40	—	8	—	8	—	12	—	12	—	4/final ex.
Hygienic aspects of food trade	16	16	—	—	—	—	—	—	—	16	—	4/final ex.
Meat inspection	36	36	—	—	—	8	—	12	—	16	—	state exam
Administrative measures pertaining to food hygiene	20	20	—	—	—	—	—	10	—	10	—	state exam
Practicals (in abattoir, meat and dairy processing units and food trade)	24	—	24	—	6	—	6	—	6	—	6	
Totals	244	220	24	54	6	56	6	56	6	54	6	
				60		62		62		60		

L = lectures; P = practicals

fore, covers the duties of the ood hygienist in the *production*, *processing*, *storage*, *transportation* and *marketing* of foods of animal origin.

It ought to be pointed out in this connection that although specialization presupposes the *disintegration* of a branch of science into the special fields it covers (single disciplines or species in the present case), its main objective remains to furnish an *integrated* knowledge of all relevant and in addition *interdisciplinary and bordering aspects.*

(f) Course in state veterinary medicine

The national animal health service functions through the system of Animal Health and Food Hygiene Control Stations established in each county of Hungary. Specialization in state veterinary medicine provides leading veterinary officers of the administration and of large livestock production units with an above-average knowledge in matters of state administration, veterinary administration, organizational and executive duties. The training programme (Table 7) combines professional and jurisdictional topics with relevant aspects of management theory and methodology.

(g) Course in veterinary laboratory diagnosis

Improvement of the facilities available to the laboratories affiliated to the Veterinary Institutes and the County Veterinary and Food Hygiene Control Stations during the last 15–20 years led to a well-functioning network of veterinary laboratories all over the country. To improve the professional level of the staff of these laboratories, a course in veterinary laboratory management and

Table 7

Curriculum: Course for specialization in state veterinary medicine

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Livestock breeding policy	15	15	—	15	—	—	—	—	—	—	—	1/end-term
Forensic vet. med.	15	15	—	15	—	—	—	—	—	—	—	1/end-term
Economic aspects of food production and trade	24	24	—	—	—	24	—	—	—	—	—	2/final ex.
Animal hygiene	20	16	4	—	—	8	4	8	—	—	—	3/final ex.
Food hygiene	20	20	—	—	—	—	—	8	—	12	—	4/final ex.
Epizootiology	24	24	—	—	—	—	—	10	—	14	—	4/final ex.
Administrative statute laws	24	24	—	6	—	6	—	6	—	6	—	state exam
State vet. med.	80	80	—	20	—	20	—	20	—	20	—	state exam
Theoretical and practical aspects of administration and management	24	24	—	—	—	—	—	12	—	12	—	state exam
Totals	246	242	4	56	—	58	4	64	—	64	—	
				56		62		64		64		

L = lectures; P = practicals

Table 8

Curriculum: Course for specialization in veterinary laboratory diagnosis

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
I. *Basic course* ($a + b + c$)												
Laboratory management and techniques	33	18	15	18	15	—	—	—	—	—	—	1/final ex.
Fundamental biometry	20	14	6	14	6	—	—	—	—	—	—	1/end-term
Safety requirements and health protection	7	7	—	7	—	—	—	—	—	—	—	1/end-term
II. *Split courses*												
(a) *Bacteriology-immunology*												
Bacteriology and immunology	40	40	—	—	—	40	—	—	—	—	—	2/final ex.
Serology	10	10	—	—	—	10	—	—	—	—	—	2/end-term
Epizootiology	10	10	—	—	—	10	—	—	—	—	—	2/end-term
Practicals	120	—	120	—	—	—	—	—	60	—	60	
(b) *Virology-immunology*												
Virology and immunology	40	40	—	—	—	40	—	—	—	—	—	2/final ex.
Serology	10	10	—	—	—	10	—	—	—	—	—	2/end-term
Epizootiology	15	15	—	—	—	15	—	—	—	—	—	2/end-term
Practicals	120	120	—	—	—	—	—	—	60	—	60	
(c) *Toxicology*												
Fundamentals of toxicology	15	15	—	—	—	15	—	—	—	—	—	2/end-term
Clinical toxicology	10	10	—	—	—	10	—	—	—	—	—	2/end-term
Feed toxicology	25	25	—	—	—	25	—	—	—	—	—	2/final ex.
Pathophysiology	10	10	—	—	—	10	—	—	—	—	—	2/final ex.
Practicals	120	—	120	—	—	—	—	—	60	—	60	
Totals												
(a) bacteriology-immunol. (I + II(a))	230	99	141	39	21	60	—	—	60	—	60	
(b) virology-immunology (I + II(b))	245	104	141	39	21	65	—	—	60	—	60	
(c) toxicology (I + II(c))	240	99	141	39	21	60	—	—	60	—	60	

techniques was launched. In view of the current and future needs, the first course in veterinary laboratory diagnosis was subdivided into branches in bacteriology-immunology, virology-immunology, and toxicology (Table 8).

Sub-specialization was achieved by split courses which followed from a basic course attended by all trainees together during the first term. Lectures in bacteriology, virology and toxicology were then held separately during the second term, and practical courses were attended during the third and fourth terms in the Veterinary Institutes, other veterinary laboratores, and in the Departments of Food Hygiene and Pharmacology of the University.

The state examination prescribed for veterinarians specializing in laboratory work includes, unlike other postgraduate state examinations, a written thesis.

(h) Course in reproduction biology

The programme of this course (Table 9) includes, further to strictly professional subjects, introduction to environment-related and health-related influences on the function of the reproductive organs, and orientation in current targets of livestock production, development schemes and economic policy.

Table 9

Curriculum: Course for specialization in reproduction biology

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Pathophysiology	18	18	—	10	—	8	—	—	—	—	—	2/final ex.
Pharmacology-toxicology	15	15	—	5	—	10	—	—	—	—	—	2/final ex.
Animal husbandry	12	12	—	12	—	—	—	—	—	—	—	1/final ex.
Obstetrics-infertility	52	36	16	6	4	10	4	8	4	12	4	state exam
Reproduction biology	54	38	16	6	4	10	4	8	4	12	4	state exam
Animal nutrition	26	26	—	—	—	6	—	8	—	12	—	state exam
Pathology	12	8	4	—	—	—	—	8	4	—	—	3/final ex.
Epizootiology	14	14	—	—	—	4	—	10	—	—	—	3/final ex.
Animal hygiene	16	16	—	—	—	—	—	6	—	10	—	4/final ex.
Totals	229	193	36	49	8	48	8	48	12	48	8	
				57		56		60		56		

L = lectures; P = practicals

As a matter of fact, specialization in reproduction biology is neither alternative to graduate training in livestock husbandry, nor does it substitute activities of the farm veterinarian.

(i) Course in clinical veterinary medicine

This course was launched quite recently for field veterinary staff, intensively engaged in clinical work either in the animal hospitals affiliated to the County Veterinary and Food Hygiene Control Stations or in large livestock production units. The participants are introduced to all aspects of the clinical care of large and small animals and to related disciplines. According to the actual needs, the training is centered on surgical and obstetric diagnostics, therapeutic methods (including surgical ones) and disease prevention (Table 10).

*

The percentual distribution of hours devoted to lectures and practicals in the disciplinary programmes of courses for postgraduate specialization is seemingly unfavourable, but in reality it has proved to be advantageous. Segregation of theoretical and practical instruction within the framework of a subject or discipline is of no avail from the gnoseological and didactical points of view; and any such distinction would act against the basic principle of inte-

Table 10

Curriculum: Course for specialization in clinical veterinary medicine

Discipline	Hours of tuition			1st term		2nd term		3rd term		4th term		Examinations term/type
	total	L	P	L	P	L	P	L	P	L	P	
Economics	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Physiology	10	10	—	10	—	—	—	—	—	—	—	1/end-term
Pathophysiology	12	12	—	12	—	—	—	—	—	—	—	1/final ex.
Forensic vet. med.	10	10	—	5	—	5	—	—	—	—	—	2/end-term
Parasitology	8	8	—	—	—	8	—	—	—	—	—	2/end-term
Epizootiology	14	14	—	7	—	7	—	—	—	—	—	2/final ex.
Pharmacology-toxicology	14	14	—	—	—	6	—	8	—	—	—	3/final ex.
Pathology	10	6	4	—	—	—	2	6	2	—	—	3/end-term
Basic clinical laboratory techniques	25	15	10	—	—	5	—	10	—	—	10	4/end-term
Medicine	40	20	20	6	—	4	—	10	—	—	20	state exam
Surgery	60	30	30	10	4	10	2	10	4	—	20	state exam
Obstetrics	40	20	20	—	—	10	5	10	5	—	10	state exam
Totals	253	169	84	60	4	55	9	54	11	—	60	

gration. It should be noted that much time has been devoted in all specialization courses to consultations on the practical application of the knowledge imparted by the lectures.

Courses leading to postgraduate specialization have been offered by the University for 15 years, and are at present available in nine subjects. Initially this type of training had to satisfy quantitative demands for specialists, and

Table 11

Current supply of veterinary specialists in Hungary (until 31 December 1986)

Specialization	Diploma awarded in	No. of graduates	Total
Poultry health	1972	51	114
	1983	63	
Pig health	1972	56	140
	1979	84	
Cattle health	1973	70	294
	1975	84	
	1977	63	
	1978	77	
Animal hygiene	1975	59	129
	1983	70	
Food hygiene	1975	65	113
	1984	48	
State veterinary medicine	1977	105	194
	1981	89	
Veterinary laboratory	1980		
bacteriology-immunology		63	98
virology-immunology		18	
toxicology		17	
Reproduction biology	1980	99	162
	1986	63	
Clinical veterinary medicine	1985	39	39
Totals			1283

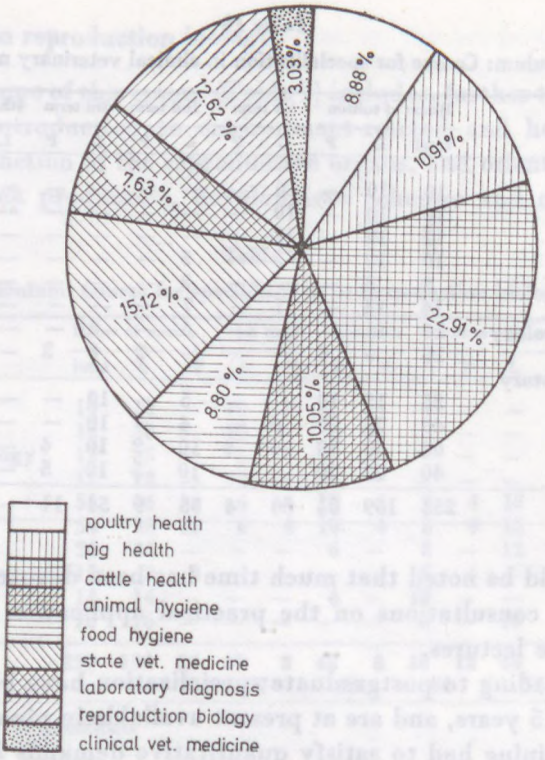


Fig. 1. **The disciplinary distribution of veterinarians holding a diploma (in %) in branches of postgraduate specialization (on 31st Dec. 1986)**

the target numbers were correspondingly high. However, in recent and future schemes, *qualitative demands on training should be preferred* with the reduction of the number of participants.

The annual and disciplinary distribution of veterinarians holding a diploma in some branch of postgraduate specialization is shown in Table 11 and Fig. 1.

The *entrance requirements* to courses for postgraduate specialization have recently been tightened. The candidates are interviewed by an *Admissions Committee*, and the quotas are established every year by a joint ministerial and university commission. The future quotas are limited to 30–40 per course. Careful planning and coordination are required in each academic year by considering available teaching staff for both undergraduate and various forms of postgraduate training.

The course leading to postgraduate specialization extends over a period of *two years (four terms) in each discipline*, with a two-week residential period of academic tuition (lectures, practicals, consultations and excursions) in each term, and self-instruction in the programmes supplied for study over the rest of the terms.

RESEARCH ACTIVITIES IN THE UNIVERSITY OF VETERINARY SCIENCE

F. SIMON, Deputy Rector
and B. ÉLIÁS, Head of the Department of Research Coordination

Research work traditionally played an important role in the activities of this University, encouraging developments in professional education in all phases of its history. With revolutionary changes in natural sciences around the turn of the century there was an upswing in veterinary science in Hungary as evidenced by the researchers who were in the vanguard of world veterinary science achievements. Early in this century, Ferenc Hutyra substantiated, for the first time in Europe, the viral etiology of swine fever, and worked out effective control measures. Aladár Aujeszky discovered the economically still important virus disease named after him. The name of József Marek is internationally renowned by the name of Marek's disease of poultry, first described by him.

From the 'thirties until the 'sixties, another generation of internationally known scientists held chairs in this school. Rezső Manninger, János Mócsy and Sándor Kotlán made many fundamental discoveries in the fields of epizootiology, clinical veterinary medicine and parasitology, and utilized their research experience to keep the standards of professional education at the highest contemporary level throughout their long careers.

From 1945, the history of research activities in the University can be divided essentially into four phases, which were hallmarked by changing trends in the national livestock production policy. However, the main guiding principles of veterinary research, (1) attention to current animal health problems and (2) close collaboration with other veterinary institutions working in the same topics, prevailed in all phases.

In the *first phase* (1945–1950), research efforts were focussed on protecting the livestock remaining after decimation by the war from infectious (swine fever, Teschen disease, foot-and-mouth disease, Newcastle disease, glanders, etc.) and non-infectious diseases (metabolic disturbances due to poor or inadequate feed supplies, vitamin and mineral matter deficiencies, respiratory and enteric diseases, infertility, etc.) responsible for great economic losses. The control of these diseases had a major share in improving the food supply of the population.

The *second phase* (1951–1970) confronted the veterinary scientists with problems of mass incidence of previously unknown or hardly known infectious and non-infectious diseases in the large herds and flocks of the evolving intensive livestock production units. The so-called rearing (for the most part respiratory and gastro-intestinal) diseases caused enormous economic losses among the new-born and growing stocks. Tuberculosis, brucellosis and other infectious diseases showed an unprecedented spread.

Short supplies of roughage and basic fodders, poor quality of the feeds and management failures accounted for a mass incidence of metabolic and reproduction disorders as well as mastitis. These problems, arising chiefly from lack of experience in the intensive system of livestock management, imposed scores of new responsibilities on the national animal health service and, above all, on the scientists of this University. New diagnostic techniques, efficient therapeutic, preventive and control measures had to be developed and applied in the shortest possible time. Although these duties were beyond the scope of the facilities then available for veterinary research, the most severe animal health problems were solved one by one, in due course, by ranking and coordination of the research targets. In the early 'sixties, the bovine tuberculosis eradication programme was launched on a national scale, vaccines were developed, and immunization schemes were elaborated for the control of the most important infectious diseases. Effective measures were introduced to reduce or even prevent economic losses from mass infertility, metabolic disorders, respiratory and gastrointestinal diseases.

Research projects in animal hygiene, animal nutrition, physiology and epizootiology played a decisive role in the reduction of economic losses by animal diseases. Important interrelationships were disclosed between the environment and the performance of animals, which were utilized in the planning of management techniques. It was demonstrated that faulty management accounted for depression of the immune response of animals, and applied research was centered on optimization of the management and feeding systems as well as the vaccination programmes. A considerable improvement of the research facilities available to the University followed during the economic boom of the late 'sixties: the construction of the radioisotope laboratory and the climatic chambers, and the purchase of many up-dated instruments (chromatographs, spectrophotometers, X-ray equipment, electron microscope, amino acid analyzer, etc.) dates back to that period.

In the *third phase* (1971–1980), research activities were centered on increasing the safety and profitability of intensive livestock production by improvement of disease control. This objective was realized on the basis of the following research results:

1. The recognition of the cause of metabolic diseases in dairy-type cows of above-average performance, i.e. of the responsibility of inadequately satisfied

environmental needs, prompted the development of new diagnostic, prophylactic and therapeutic methods for the control of subclinical metabolic disorders. Investigations into digestion physiology led to improvements in feed conversion through proper feed storage, and the assessment of optimal proportions of constituents in compound feeds.

2. The parameters of the optimal production environment were determined for the most important species, interrelationships were disclosed between the diet and resistance of the animals, and evidence was given on the immunosuppressive effect of mycotoxins. Research in environmental physiology threw new light on interactions between the animal and its environment, on the etiological involvement of environmental stress and microbes in multifactorial disease incidence, and on possibilities of the reduction of losses from such diseases in sheep, pigs, cattle and poultry. New disinfectants and disinfection methods were introduced, and a new test procedure was developed for checking the efficiency of disinfection. Finally a complex system of specific and nonspecific measures was elaborated for the prevention and control of multifactorial diseases under large-scale management systems.

3. Experimental studies into the partus-syndrome of cows led to improvements in oestrus synchronization and metritis therapy, and ultimately to an appreciable improvement in bovine reproduction performance. Hormone diagnostic approach to the early recognition of bovine pregnancy was utilized for reducing the calving interval.

4. Several potent drug combinations were developed to reduce economic losses from different bacterial diseases. The range of potent anti-parasitic drugs was extended and new liver protecting and growth promoting agents were issued.

5. Important observations were made on the etiology and specific prevention of viral, bacterial and mycoplasmal diseases of the bovine respiratory and gastro-intestinal tract. Investigations into porcine respiratory and enteric viral and bacterial diseases, and Aujeszky's disease disclosed new possibilities of effective control. A potent vaccine was developed against the adenovirus-induced respiratory disease of sheep. Certain not previously observed poultry diseases [Derzsy's gosling disease, duck plague, egg drop syndrome (EDS), Gumboro disease] were identified in large flocks, and effective measures were elaborated for their prevention.

The *fourth phase*, which began in 1980 and still lasts, has been characterized by research efforts centered on improving the quality of foods of animal origin and reducing their production costs. Research interest has been increasingly centered on the detection of toxic drug and chemical residues in the food chain (soil-plants-animals-man). An SPF pig herd programme was launched as well as programmes for herds or flocks free from Aujeszky's disease, leptospires, pathogenic mycoplasmas, bordetellae, enzootic bovine leucosis, etc.

Investigations into the reduction of environmental (soil, water, air, etc.) pollution have been supported by special grants. Government funds have also been made available to support basic research in selected topics, and investigations into adopting new research techniques and results.

Organization and coordination of the research projects in the period 1981–1985

(a) Research programmes coordinated by the University

The project entitled "Elaboration of fundamental animal health measures for increasing the safety and promoting development in food production" was executed by eight inter-disciplinary work groups (environmental physiology, animal nutrition, bacteriology, virology, immunology, parasitology, pharmacology-toxicology, food hygiene). Altogether 44 topics were studied in this programme, 30 in charge of the University, and 14 in charge of five other veterinary institutions (Veterinary Research Institute of the Hungarian Academy of Sciences; Central Veterinary Institute; Phylaxia Veterinary Biologicals and Feedstuffs Ltd.; State Institute for the Control of Veterinary Biologicals; Institute for Livestock Husbandry and Feed Quality Control). The greater part of the topics fall into the applied and development-oriented research category, the lesser into the basic research category. The University undertook the planning of the programme, collecting interim reports and of handling the funds.

(b) Programmes supported by competition grants

Five mostly applied, but partly basic research programmes executed by the University were supported by competition grants offered by the Hungarian Academy of Sciences and the national Science Policy Commission. These programmes covered the following topics: "Improvement of the energy-saving preservation of corn-on-the-cob and biological effects of preserved corn"; "Application of the Calan-Broadbent electronic feeding system in cattle feeding"; "Utilization of biotechnical methods in the production of beef cattle satisfying export requirements"; "Sexual activity of domestic animals"; "Residue detection in the organs of slaughter animals and poultry".

(c) Research cooperation with gestor farms and livestock production enterprises

Seven applied research programmes were executed by the University under the auspices of the Livestock Production and Development Enterprise (Kaposvár), and some other programmes on behalf of the agricultural cooperative enterprises BOSCOOP and TAURINA.

(d) Disciplinary research

On a total 47 discipline-related research topics have been investigated by the teachers and scientists of the University with the aim of expanding knowledge on certain theoretical aspects of their chosen discipline. The results of these investigations were utilized to raise the standards of undergraduate teaching and to implement certain details of the comprehensive research programmes.

(e) Research contracts

In the last five-year period, development-oriented applied research was conducted at the University Departments in a total of 254 topics, on the basis of contracts with various agricultural and industrial enterprises. Most topics covered by the research contracts were closely related to those of the main research projects, and so it happened that one programme furnished appropriate conditions for the field trial, or even the practical application of preparations and/or methods developed by basic research in the framework of another. Funds received by the University for contractual projects have been used to purchase equipment, to support study tours to foreign countries, and to remunerate staff members who carried out the projects.

(f) Research programmes coordinated by other institutions

The University cooperated in two government-controlled research projects (meat and milk production based on bulk feeds and by-products; development of animal production based on fodders and compound feeds), by studying and/or coordinating certain topics, and it undertook two topics of the programme entitled "Agricultural chemistry", and one topic of the environmental pollution research project sponsored by the Ministry of Agriculture and Food.

Research staff and facilities

Work in so many research projects within the last five-year period could be mastered only by close collaboration of the University's entire teaching and research staff. The total graduate staff has numbered 135–150 persons; many of them hold postgraduate scientific degrees and several are internationally known for original research contributions. Thus, although the greater part of the working hours has been devoted to teaching, the intellectual capacity available for research ambitions is still considerable. With the large number of its graduate staff and the wide range of disciplines covered, the University represents the largest veterinary research unit of this country.

The research capacity of the university staff in several projects has been expanded by close collaboration with scientists of other research units, such as the Veterinary Research Institute of the Hungarian Academy of Sciences, the Central Veterinary Institute, the State Institute for the Control of Veterinary Biologicals, the Phylaxia Veterinary Biologicals and Feedstuffs Ltd., etc. and with collective and state farms, agricultural and industrial enterprises. About 70 per cent of the topics investigated has been studied in collaboration with specialists of the livestock and food industry.

International cooperation has also helped in attaining several research targets. Collaborative research in topics of common interest has been promoted by the University's cooperation agreements with foreign institutions of veterinary education (Faculty of Animal Husbandry and Veterinary Medicine of the Humboldt University of Berlin (GDR) and of the Karl-Marx University of Leipzig (GDR), Institute for Veterinary Bacteriology (Jena, GDR), Veterinary College, Košice (ČSSR), University of Veterinary Science, Vienna (Austria), Veterinary College, Hannover (FRG), Veterinary Faculty, University of Utrecht (Holland).

The Central Laboratory, established in 1986, offers in every respect updated facilities for many lines of research work.

Main research advances in the period 1981–1985

The issues of the research programmes executed in the above five-year period satisfied the requirements set by the livestock and food industry, and promoted advances in veterinary science and education.

Research results of international interest have been published in topics of animal hygiene, animal husbandry, physiology, pharmacology, epizootiology, internal medicine, gynaecology, parasitology and animal feeding.

Studies into the influence of management-related stress factors (low or high ambient temperature, low feed energy levels, abrupt change of environment) on the adrenocortical function of pigs substantiated the ability of this species to adapt to extreme environmental stress by increasing its glucocorticoid secretion.

The methods of inducing twin pregnancy were improved. Monozygous twin pregnancy was produced in ewes by embryo splitting. A new method, based on immunogenetical and biochemical markers, was developed for the estimation of zygosity in cattle populations.

Investigations into the avian thyroid function demonstrated sensitivity of the peripheral thyroxin-triiodothyronine transformation to ambient temperature changes, and the impact of feed energy levels on peripheral hormone metabolism.

The role of faulty feeding, above all of excessive feed energy levels, in the fat mobilization disease of cows has been elucidated.

Analysis of several thousands of feed, urine and faecal samples led to elaboration of a method for checking the mineral supply of pigs.

The etiological involvement of parturition, advanced age, high dairy performance, excessive feeding and lack of exercise in the bovine partus syndrome was elucidated. The prognostic importance of serum AST elevation with simultaneous drop of cholesterol and albumin levels was recognized and utilized for the diagnosis of the syndrome.

Complex preventive measures, combining immunization, drug treatment and disinfection were developed for the control of respiratory and gastrointestinal diseases in calves (RS-PI-3, adenoviruses, *E. coli*), pigs (Mycoplasma, Pasteurella, Bordetella, Haemophilus, Treponema) and sheep (adeno- and reoviruses, PI-3).

An equipment was constructed for the efficient and relatively inexpensive immunization of herds and flocks by aerosol.

Drug combinations, iron substitutes, oral and infusion preparations suitable for the prevention and therapy of liver diseases in ruminants were developed.

The prevalence and importance of calf and lamb coccidioses was assessed, and new anti-parasitic preparations (Neocidol, Levamisole, Ivomec, Sebacil, Tabanidine) were tested for efficacy.

Summarizing, the University still holds a central position in Hungarian veterinary research, although the role and importance of other research units have also increased considerably in the meantime. Several research teams of the University have presented important results which have been duly appreciated both at home and abroad. In the five-year period considered, the scientists of the University have published more than 1000 research papers (more than 30% of them in foreign languages and foreign journals), and presented several hundred papers at congresses and other meetings abroad.

The research achievements of the University have appreciably increased the safety of livestock and food production and exportation, and have thereby contributed to improvements in the national economy. The success of the practical application of the research results has rested, and will rest, with the well-organized national animal health service and with the veterinary practitioners dedicated to their profession.

NATIONAL AND INTERNATIONAL RELATIONS OF THE UNIVERSITY OF VETERINARY SCIENCE

Gy. LAMI, Deputy Rector

Keeping the University's teaching and research activities abreast with current demands on the profession presupposes familiarity with current trends in the domestic food industry and trade, with special regard to those aspects which require veterinary (medical, managerial or administrative) collaboration. Contacts established between the University Departments and the animal health service at different levels, large-scale liverstock farming enterprises, food industry units or universities handling related branches of agricultural sciences, promote orientation in current problems of livestock and food production to the mutual advantage of the parties involved. Continuous exchange of information between the University and the establishments in charge of practical application of advances in veterinary science, has increased the efficiency of teaching and research on the one hand, and of livestock and food production on the other.

1. Relations to national institutions and enterprises

Connections of the University in Hungary geared *at improving the quality of training (above all practical training) and the efficiency of research* have always been most intense and varied ensuring from the beginning an important role in the development and achievements of domestic animal health service and professional organizations.

Connections with domestic institutions, agricultural and industrial production units, etc. have been determined primarily by the main functions (teaching, research, services) of the University, and have been maintained as *permanent* or *occasional* contacts, in accordance with the multiple and complex activities of the school.

Particular importance has been attached to *permanent* connections entailing the assistance of institutions, social and professional organizations, and persons by means of practical training, state exams, postgraduate training, research, bilateral agreements, animal health services, expert advice

(including those by the Forensic Veterinary Medical Supervisory Committee of the University of Veterinary Science).

In this regard the University has greatly appreciated the invaluable contributions of the County Veterinary and Food Hygiene Control Stations, the veterinary diagnostic institutes, other institutions, as well as of farm veterinarians, for the success of practical courses, which form an integral part of veterinary undergraduate training (see chapter "Education in the University of Veterinary Science" for more details). At the field course tutor level alone, about 220–230 farm veterinarians and 50–60 veterinary scientists have served as tutors in the prescribed practical work of veterinary undergraduates on a yearly basis, and many other district or farm veterinarians, in the vicinity of the capital, have served as practical tutors in general veterinary medicine during the terms. Excursions for undergraduates arranged during terms for instruction in special aspects of the profession have also been based on permanent connections of the University with the institutions or farms visited.

Leading veterinary officers and scientists on the staff of various veterinary institutions have been regularly *consulted* by the University in important matters of undergraduate or postgraduate teaching, such as modification of the curricula, critical evaluation of general or special disciplinary programmes, integration of a new subject into the curriculum, etc. Veterinarians of higher professional ranks (10–15 persons per annum) have also served on the board of *examiners* at state exams; their collaboration in teaching activities is beneficial to streamline education policy, according to practical requirements.

During the last 15 years, since the University's *postgraduate training* system has been established in its present form, this system itself has become a source of expanding connections. The consultations held during postgraduate curricula are regarded by the university staff as a forum for *exchange of ideas* between postgraduate, extension or specialisation trainees, and the teachers involved.

Connection maintained with livestock production units, gestor farms and plants are also utilized in the planning and execution of *research* programmes (see pp. 86–87 for details).

A further important category of permanent connections is represented by *cooperation contracts* between the University and production enterprises or institutions. Part of these are essentially *research contracts*, which cover purpose-oriented remunerated projects related to research programmes of the University, but for the direct or indirect benefit of livestock production, animal products industry or drug industry. Recently about 25–30 per cent of such research contracts have been concluded with livestock production units or enterprises, 40–50 per cent with drug factories, and about 20–25 per cent with other (in 12 per cent of the cases foreign) veterinary diagnostic or research institutions.

The other part of the cooperation agreements covers *mutual services rendered free of charge*, to the benefit of both parties involved. Such agreements have been reached with livestock production enterprises, vaccine production institutes, drug factories, medical universities, nutrition research institutions and regional intermediate-level organizations of the state administration.

Specially appreciated among such connections are those maintained to certain internationally reputed agricultural production enterprises, such as those of Agárd, Bábolna and Mezőhegyes. These enterprises, precisely speaking complex agro-industrial production units, provide for a natural school farm system for veterinary undergraduate training which the University could not afford to run on its own. The University reciprocates these services by submitting research results applicable for improving profitability of production.

The cooperation agreement maintained with the Bábolna enterprise deserves special mention. The national and international reputation, important innovation activities, economically high outputs and wide international relations of this enterprise, supported by high professional and managerial standards of its staff, have furnished up-to-date management and animal disease control systems, many elements of which can be directly integrated into the veterinary undergraduate training programme (genetic work; establishment of SPF herds and flocks; egg production and hatching systems; husbandry, management, feeding and disease control measures under intensive systems of poultry, pig, sheep, horse and rabbit production; operation of abattoirs for meat exporting; feed mixing plants; laboratory and post-mortem diagnostic work, etc.). Last but not least, the meticulously integrated work organization at all levels, witnessed by the undergraduates daily during their field courses in Bábolna, greatly contributes to their *professional moral and general education* (for future work in their chosen field).

Cooperation agreements reached between the University and the drug factories *Phylaxia Veterinary Biologicals and Feedstuffs Ltd.* and *Alkaloida Chemical Works Ltd.*, cover the mutual utilization of precious instruments, and exchange of experience gained on study tours abroad.

Cooperation with the *Semmelweis University of Medicine* (Budapest), cover overlapping fields of human and animal disease control, with special regard to zoonoses, public and animal health problems related to protection of the environment, common medical and veterinary problems of food hygiene, etc. Joint sessions of the medical and veterinary medical scientists engaged in these problems promote mutual understanding in topics of common interest, since, although the final *objective of animal disease control* is *to increase returns on livestock production*, the means required to attain this goal presuppose a *medical outlook and the use of medical techniques.*

The University cooperates with the *Central Research Institute for Food* to improve the hygienic conditions of processing, storage and marketing of

food products of animal origin, and to minimize quality losses in valuable foods by hygienic processing, storage and marketing. The contracting parties regularly exchange ideas and experience; the University integrates advances in food hygiene into the disciplinary programmes of undergraduate and postgraduate teaching, and the scientists of the research institute assist the veterinary undergraduates in preparing their state exam thesis. Research Associates of the Institute serve on the board of examiners at state exams at the University, and participate in research programmes on food hygiene by introduction of new testing methods, the determination of nutrient value of the protein of new food products, and on improving radiation techniques for the preservation of meat.

A good example of organized cooperation with a *non-veterinary*, non-educational institution is the agreement of the University with the *Executive Committee of the Council for the County Bács-Kiskun*. The cooperative relations with this intermediate-level organization of the state administration authority are geared at improving the general educational level of veterinary undergraduates, more precisely, at introducing them into those social and cultural activities, which are concomitant responsibilities of educated people employed in villages.

Services rendered by the University to public entail a broad range of connections in themselves. The *veterinary medical services* rendered by the University Departments, Clinics and Outpatient Clinic to owners of pet and food producing animals in the capital and its surroundings cover diagnostic, surgical, therapeutic and prophylactic work and, if required, special pathological, parasitological, microbiological, etc. diagnostic tests. The extent of this scope of duties can be assessed from the forthcoming Table, which shows the numbers of sick animals treated in the University in the four-year period 1981–1984.

Unit	No. of patients admitted			
	1981	1982	1983	1984
Outpatient Clinic	7 166	11 151	12 091	13 310
Clinic of Medicine	6 584	8 007	8 191	10 475
Clinic of Surgery and Ophthalmology	4 712	5 840	5 830	7 333
Clinic of Obstetrics	1 894	2 183	1 920	2 402
Total	20 356	27 181	28 032	33 520

An important service rendered by the University to the professional public is the function of its Central *Library* as national central veterinary library (see p. 133 for details).

Certain Departments of the University render *veterinary medical services* or *professional advice* on a permanent or occasional basis to other institutions, including organizations at different levels of the animal health service.

A special aspect of the advisory activities is represented by the legally based and permanent working contact of the Forensic Veterinary Medical Supervisory Commission of the University of Veterinary Science with jurisdictional organizations and investigation authorities (for substantional and functional details about the Commission see p. 194).

Last but nor least, mention should be made of the *personal contributions* of several teachers of the University to *national science policy* and to the activities of *professional organizations*, through honorary offices held in the Department of Agrarian Sciences of the Hungarian Academy of Sciences, in the Hungarian Veterinary Society, or in the editorial boards of the veterinary journals "Magyar Állatorvosok Lapja" and "Acta Veterinaria Hungarica".

In view of the broad and manifold relations, the *system of domestic connections* of the University *extends to the whole country*. As to the *future prospects of home relations*, it has been decided to foster only those agreements and contacts which proved to be advantageous to both parties involved. With revisions to this effect in progress, it seems to be contradictory that the development scheme of the University is pursuing further collaborative contacts, to achieve special teaching and research objectives which require close cooperation with various institutions (e. g. embryo transfer station, veterinary or zootechnical research institute, veterinary diagnostic institute, county animal hospital, vaccine production institute, special livestock production enterprise, etc.).

The recently founded *Central Laboratory* of the University is in charge of feed analysis. Metabolic (biochemical), microbiological and other tests are performed and standard parameters for such tests are determined, to serve not only the University, but also as a contractual service for livestock production units, drug and food industry plants, etc. The Central Laboratory additionally serves as the innovation centre of the University.

2. International relations

Close relations to foreign veterinary schools and other veterinary institutions have been traditionally cultivated by the University throughout its 200-year history. Since a full retrospective survey of these would exceed the scope of this review, only the connections maintained or established in the period 1981–1985 are described in detail, to throw light on the present trends of international relations.

The current system of international connections proved to be advantageous to all parties involved.

(1) *Study tours* are available to the graduate staff of the University

— under inter-state (ministerial level) interchange agreements,

— under direct (inter-school) agreements with foreign institutions of veterinary education by fellowships offered by home or foreign institutions,
— by (occasional) personal invitations to professional or scientific meetings (congresses, symposia, etc.) abroad,
— by expert activities abroad on behalf of home institutions or enterprises,
— on personal invitation by a foreign institution.

Undergraduate interchange programmes (on parity basis) form part of the direct (inter-school) agreements referred to above.

(2) *Foreign visitors* are received in the University Departments for study tours or other purposes

— under inter-state or direct (inter-school) *interchange agreements*,
— for *postgraduate studies*,
— for *guest lectures*, on special invitation extended by the University.

Undergraduates of foreign nationality are accepted to work for the degree of Doctor of Veterinary Medicine, if they satisfy the entrance requirements.

During the last decade the greater part of study tours from, and visits received in, the University has been covered by the inter-state and direct (inter-school) *interchange programmes*, which are operated equally, on parity basis (in every case, the delegating institution meets the travel expenses, but the visited institution provides for the costs of board and lodging). Interchange of undergraduates for curricular (usually summer) practical courses also operates on parity basis.

The (ministerial-level) *inter-state* agreements for cultural and scientific-technical cooperation have offered study tours (on parity basis) to teachers and scientists of the veterinary colleges of the University from Czechoslovakia, Cuba, the German Democratic Republic, Mongolia, the Netherlands, Poland, Romania, and the Soviet Union, for 5–30 days per annum. These short study tours have been generally made use of for methodical studies, consultation, or orientation in teaching methods or research problems of mutual interest.

Parity-based direct *inter-school interchange* agreements have been maintained with foreign *sister institutions* for about 30 years. The University at present has valid cooperation agreements with eight veterinary colleges abroad, such as the

— Faculty of Animal Husbandry and Veterinary Medicine, Humboldt University of *Berlin*, GDR,
— Veterinary College of *Hannover*, FRG,
— Veterinary College of *Košice*, ČSSR,

— Faculty of Animal Husbandry and Veterinary Medicine, Karl-Marx University of *Leipzig*, GDR,
— Veterinary Academy of *Moscow*, USSR,
— Veterinary Faculty, University of *Utrecht*, the Netherlands,
— University of Veterinary Science, *Vienna*, Austria,
— Veterinary Faculty, *Warsaw* Agricultural University, Poland (Table 1).

Table 1

Graduate und undergraduate exchange programmes of the University of Veterinary Sciences with foreign colleges (1985)

Foreign schools	Graduates exchange quota days/year	Undergraduates exchange for practice	
		annual quota weeks/year	No. of persons
Faculty of Animal Husbandry and Veterinary Medicine, Humboldt University of *Berlin*, GDR	42	—	—
Veterinary College of *Hannover*, FRG	117	6	8
Veterinary College of *Kosice*, CSSR	42	3	9
Faculty of Animal Husbandry and Veterinary Medicine, Karl-Marx University of *Leipzig*, GDR	48	4	5
Veterinary Academy of *Moscow*, USSR	20	—	—
Faculty of Veterinary Medicine, University of *Utrecht*, the Netherlands	12	—	—
University of Veterinary Science, *Vienna*, Austria	108	—	—
Veterinary Faculty, Agricultural University of *Warsaw*, Poland	49	3	9

Recently the Veterinary Faculty of the University of *Belgrade*, Yugoslavia, has initiated resumption of the temporarily suspended cooperative contacts to this University.

Further to the scientist interchange programmes, the inter-college cooperation agreements cover recommendations for improvement of the cultural and scientific-technical contacts between the countries involved, and part of them also provide for *cooperation in undergraduate and postgraduate training*, by exchange of textbooks, scripts, general and special disciplinary programmes, slides, films and other demonstration, and teaching aids, etc. The possibilities of compiling textbooks by Hungarian and German coauthors are being studied by lecturers of this University and the Faculty of Animal Husbandry and Veterinary Medicine of Leipzig.

Research cooperation in topics of common interest is also promoted by the inter-college agreements. The contracting parties regularly exchange information on current (mainly basic) research projects, and invite scientists of the partner institution to national or international *professional meetings* held in the country. Publications are regularly exchanged, and results of cooperative research are published jointly with the partner institutions. Specialists of the partner institutions may be mutually invited to serve as referees for

theses submitted to obtain postgraduate scientific degrees. Great importance has been attached to mutual invitations of professors or other teachers and scientists (of other professional ranks) as guest lecturers.

Undergraduate exchange for intra-term curricular practical courses is covered by the cooperation agreements with four foreign veterinary colleges, and put into effect on a parity basis. Groups of undergraduates of foreign veterinary schools had already paid visits from the early 'fifties, but initially the main objective had been merely tourism and practice in a foreign language. Later the professional aspect of such visits was asserted, and recently field courses oriented towards the disciplinary programme of the delegating institution have been prescribed for the visiting undergraduates. Five fifth-year students of this University and an accompanying junior teacher are received in Hannover every year for the six-week (42 man/days) summer practical course, and groups of 9, 5 and 9 students, each with an accompanying junior teacher, attend their curricular summer field course for 21, 28 and 21 days in Košice (ČSSR), Leipzig (GDR) and Warsaw (Poland), respectively. On parity basis, 8 (from 1986 10) undergraduates of the Hannover school, and 9, 5, and 9 undergraduates of the other mentioned schools, respectively, with accompanying teachers, attend their practical classes in the Clinics of the University of Veterinary Science (Budapest), in animal hospitals affiliated to the County Veterinary and Food Hygiene Control Stations, and/or in intensive livestock production units of agricultural production enterprises.

To illustrate how partner schools can profit from undergraduate exchange, let us consider the relations with one school, the Veterinary College of Hannover (FRG), in greater detail. The undergraduates of that school, greatly appreciate the opportunites offered in large livestock production units of Hungary, the University Clinics and the county animal hospitals to perform occasionally surgical interventions, which are rarely available in their home country. Livestock farming in specialized large-scale units, and in special farm-owned slaughterhouses (e.g. in the broiler rabbit abattoir of Bábolna) of veterinarians provide excellent insight into the veterinarians' responsibilities in large-scale livestock farming systems. Our final-year undergraduates of this University, on the other hand, appreciate and profit much from the considerably higher level of technical-instrumental facilities available for veterinary diagnostic and laboratory work in the FRG.

Another aspect of undergraduate contacts at an international level is participation of students of this University at international *Conferences of Undergraduate Research Groups*. Such Conferences have been organized on a regular schedule by the veterinary colleges of Košice (ČSSR), Leipzig (GDR) and occasionally at Stara Zagora (Bulgaria).

The organization of the so-called "*Budapest days*" abroad provides for representative occasions to introduce teaching and research activities of our

school as well as the life of our students to the respective foreign audience. This type of foreign relations is also realized on mutual basis (e.g. organization of "*Leipzig days*" in Budapest).

Invitations extended to scientists of this University either personally, or through the institution, for presenting reviews or research papers at *international meetings* (congresses, symposia, etc.) in various countries of Europe and overseas also cover an important sector of the University's international relations.

For example, in 1984 lecturers and scientists of this University attended 21 scientific meetings in 13 foreign countries (Austria, Belgium, Czechoslovakia, Finland, France, FRG, GDR, the Netherlands, Italy, Mexico, Switzerland, Turkey, USA) for a total of 150 days (slightly more than 10 per cent of all days spent abroad in 1984), in most cases as *participants* or *speakers* (co-referents). The meetings were organized by international organizations (FAO, EAAP, OIE), national professional organizations (Veterinary Societies of Austria, GDR, and FRG), or colleges (Veterinary College of Košice, ČSSR; Veterinary College of Brno, ČSSR; veterinary faculties of Berlin, Leipzig, GDR; etc.). The congress topics covered poultry diseases, pig diseases, parasitology, animal hygiene, surgical and ophthalmological techniques, reproduction biology of mares, current problems of rabies, etc.).

Long-term (30-day or longer) assignments to foreign countries are realized either by *expert* contracts, or by *fellowships* offered by home or foreign institutions; occasional employments abroad also fall into this category. Expert contracts (for 30 days or longer, sometimes several years) are offered by the FAO or the TESCO (Hungarian office for the organization of intellectual export). FAO-experts are assigned to certain developing countries (e.g. Afghanistan, Uganda, etc.) or to regional projects. TESCO experts exert activities in certain socialist countries (Cuba, Mongolia, Vietnam). In 1984, 13 graduates staff of the University spent 30–120 days each (on a total 917 days) abroad on fellowships offered by different institutions of the FRG, Great Britain, the Netherlands, USSR and USA.

Indirect relations to foreign institutions have arisen from *expert or advisory activities* of graduate staff of the University on behalf of different (non-educational) domestic institutions or enterprises (Hungarian Academy of Sciences, Medimpex Foreign Trading Enterprise for Pharmaceutical Products, drug factories, gestor farms, etc.), or by particpation in professional (ministerial-level or other) delegations to various countries of Europe, Asia and Latin America.

The statistical survey of the service-related foreign travels of the University's graduate staff in 1984 in terms of person(s)/days and in percentages of the total staff, portrays the current dimensions of international relations of the University.

Service trips to Socialist countries:

Czechoslovakia	15/78	GDR	18/117
Cuba	2/60	USSR	6/106
Poland	2/21	Vietnam	1/30
Mongolia	1/30		

Totals: 7 countries: 45/442 (44.1 per cent/29.8 per cent)

Service trips to Western countries:

Austria	13/72	Greece	1/41
Belgium	2/9	the Netherlands	3/131
Finland	2/10	Italy	1/5
France	3/30	Switzerland	3/12
FRG	16/451	Turkey	3/15
Great Britain	3/68	USA	4/205

Totals: 12 countries: 54/1022 (52.9 per cent/69.0 per cent)

Service trips to developing countries:

Algeria	1/4
Egypt	1/7
Mexico	1/6
Totals:	3 countries: 3/17 (2.9 per cent/ 1.1 per cent)

Summarizing, in 1984, the graduate staff of the University were abroad on a total of *102* service trips of various kinds (including two of more travels by single persons), in *22* foreign countries, for a total of 1481 days.

The number of *foreign visitors received* by the University for short or longer study tours under the inter-state and inter-college cooperation agreements, and the number of days they spent in Hungary, roughly correspond, for reasons of parity, to the quotas fixed under the same agreements for Hungarian visitors to the partner schools or institutions. Outside these agreements, the University invites every year 3–5 internationally reputed foreign professors as guest lecturers. Foreign graduate veterinarians are occasionally received for research or refresher training, under the auspices of the FAO (e.g. from Afghanistan, Turkey, etc.) or TESCO (e.g. from Cuba, Vietnam, etc.), or on behalf of the Hungarian Academy of Sciences to work for a postgraduate degree (e.g. from Algeria, Egypt, Mali, Mongolia, Vietnam, etc.), or for the university degree of Doctor of Veterinary Medicine, by special approval of the Council of the University (e.g. from the GDR and FRG).

Since the 'sixties, the graduate staff of the University have paid professional visits (for the most part on exchange basis) to *all European countries* except Albania, Cyprus, Iceland, Portugal and the smaller states. Overseas service trips have been less frequent, but regular. The number of service trips abroad tends to increase steadily; the per annum average of foreign travels has doubled from 20–25 in the late 'fifties and early 'sixties in recent years.

The University has always been prepared to establish national and international relations to the mutual advantage of the parties involved to improve its teaching and research activities and, indirectly, livestock and food production conceptions.

HISTORY OF THE DEPARTMENTS (OTHER SCIENCE-RELATED UNITS) AND DISCIPLINES

Department of Agricultural Economics

Agricultural economics, farm management

L. Visnyei

An independent department of agricultural economics was founded in the University of Veterinary Science relatively late (in 1966). It functioned only for two years, and its re-foundation in 1984 was also short-lived, but subjects related to that discipline have been taught in the school for more than 80 years. A subject named "*Social policy and economics*" was in charge of an invited lecturer, Jenő Czettler (1879–1954), LL.D., Director, later Vice-President, of the Hungarian Farmers' Association, Titular Deputy Minister, and Corresponding Member of the Hungarian Academy of Sciences (1922–1949). In the academic year 1917/18, the subject was re-named as "*Introduction to national economy and social policy*", and was referred to an optional course. However, it was obligatory, and re-included again in 1920 (as "*Co-operative husbandry and trade in animals and animal products*") and János Horváth (1853–1945), LL. D., Director of the National Association of Co-operatives, was invited as its lecturer. From the academic year 1926/27 onward, the lectures were held by Károly Ihrig, LL.D., Secretary of the National Farmers' Association and Titular Professor of the Faculty of Economics. The lectures in the two topics covered by the subject were divided between two terms, "*Co-operative husbandry*" having been dealt with in two lectures a week during the third term, and "*Trade in animals and unprocessed animal products*" also in two lectures a week during the fourth term. The course covered the basic conceptions of national economy, the main problems of social policy, and introduction to the economic aspects of production, consumption and trade. From the academic year 1930/31 on, count István Teleki, Doctor of Political Sciences, Director of the National Farmers' Association, took charge of teaching the subject for four years, from 1933 under the simplified name "*National economy*". From 1934, the lecturer's duties were resumed by Károly Ihrig, at that time Director of the Institute for Agricultural Policy, and full Professor in the Division of Agriculture, Faculty of Agricultural and Veterinary Sciences, József Nádor University of Technology and Economics.

After World War II, the subject was entered into the curriculum as "*Agricultural policy*", and Imre Nagy (1886–1958), then Professor of the

University of Economics, later Prime Minister and Corresponding Member (1949), later Member, of the Hungarian Academy of Sciences (1952), served as its lecturer from 1948 to 1951.

Introduction to economics was omitted from the veterinary curriculum from 1952 to 1959. A course in "*Agricultural economics*", covering three hours a week in the sixth term, was held again in 1959–1961, and József Berend, Reader in Economics was in charge of it as invited lecturer. From 1961 to 1964, the course was reduced to two lectures a week, and was held during the seventh term.

An independent Department of Agricultural Economics was then founded in 1966, with Lajos Horváth (born 1917), who graduated in livestock production engineering and agricultural economics, as its Head in the capacity of Reader. He has lectured in agricultural economics in three lessons a week over two terms, and has also held a course in *farm management*, which covered three lessons a week during the ninth term.

Introduction of the veterinary students to the managemental aspects of livestock farming has been traditional in the school. Training along that line had been proposed as early as in 1857, but had been hampered by the shortness of the training time. More than half a century had elapsed until, in 1919, a course in "*Agricultural production*" was added to the curriculum, in charge of József Schandl, Professor in the faculty of Economics. In 1922, the subject was re-named as "*Agricultural production and management*", and professors of the Agricultural Academy (János Hauser, Béla Pesthy, László Csiki) served as its lecturers until 1944.

From 1945 to 1947, the veterinarian and Professor of Animal Husbandry Zoltán Csukás gave two lectures a week during the first and second term in "*Agricultural production*". From 1941 to 1950, the subject was re-named, "*Encyclopaedia of agriculture*" and was advanced to the third and fourth term. From 1950 to 1954, two lectures were held weekly in "*Encyclopaedia of agriculture*" and "*Introduction to agricultural sciences*" as independent subjects, during the first term again, by Ernő Bócz. In the academic year 1954/55, a course in "*Management of livestock production units*" was held by Gábor Almási, who gave two lectures a week in the ninth term, and one lecture a week in the tenth term. From 1956 to 1965, a course in "*Production under the Socialist system of agriculture*" was held in the third term, with two lectures a week, in charge of Ede Haraszti. The name of the subject was changed to "*Farm management*" in 1956.

The Department of Agricultural Economics ceased to function on the 15th September 1968, and István Szlameniczky (1931) was invited to lecture in agricultural economics, for five years on the original shedule, and from the academic year 1973/74 to 1984 for two hours a week in the sixth term. I. Szlameniczky, by profession a livestock production engineer, had been on the staff

of the Central Planning Board for 15 years, served as Deputy Division Head on the Central Committee of the Hungarian Socialist Workers' Party from 1975 to 1978, and has been President of the National Association of Co-operatives since 1978: he was awarded his "Candidate of Economic Sciences" degree in 1978. Szlameniczky analysed in his course mainly the production, processing and marketing of products of animal origin, the interrelationships of livestock production with the national economy, and the responsibilities of the veterinarian in the profitability of livestock production.

In 1968, lecturing in farm *management* was again assigned to Ede Haraszti; the course was transferred to the ninth term and covered five lectures a week, from 1973 to 1978 three lectures a week. In 1978, the subject was renamed "*Economic aspects of agricultural enterprises*", and the course, covering two lectures a week, was transferred to the seventh term until 1984. Having recognised the close association of veterinary work with production techniques under the large management system of livestock farming, E. Haraszti focussed his lectures on the management-related aspects of livestock production, and invited outstanding specialists of the field as co-lecturers. Of these, special mention should be made of László Papócsi (1939), veterinary doctor and Candidate of Veterinary Sciences, at present Deputy Minister of Agriculture and Food, in the period of his co-lecturing, Deputy Director General of the Amalgamated Agricultural Enterprises Bábolna.

The Department of Agricultural Economics was re-founded in the University of Veterinary Science in 1984, after a break of 16 years, and took charge of a course in the discipline "*Economic aspects of food production*", which was to replace the subjects covered by the discipline "farm management", from the academic year 1984/85 onward. That course was prescribed for the fifth term and covered two lectures a week. Dr. Magda Csizmadia (1927–1985) was appointed its lecturer, and Head of the new Department. In her person the first female professor joined the body of teachers of the University of Veterinary Science. She took her university degree in economics, and was awarded the university degree of "Doctor of Economics" (equivalent to masters degree) in 1958, the Candidate of Economic Science in 1966, and Doctor of Economic Science 1983. Before joining the staff of the University, she had served as Professor of the Postgraduate School for Engineers and Managers, functioning under the auspices of the Ministry of Agriculture and Food. Her scientific interest was centered on pioneer investigations into the economic aspects of the development of agricultural co-operatives. Her one-term career as Professor of the Veterinary University was terminated by sudden untimely death, which caused the Council of the University to suspend the functioning of the Department of Economics again, for an indefinite time.

Department of Anatomy and Histology

Anatomy, histology, embryology

Gy. Fehér

Anatomy

Morphology has been taught in this school ever since its foundation in 1787. Its founder, Sándor Tolnay, had given his first lectures on anatomy, and his assistants Ignác Pohl (from 1789) and Péter Stulfa (from 1803) also lectured on that subject. From 1811, Román Brunkala taught the veterinary students gross morphology of the skeletal system and visceral system of animals, in parallel lectures given in Hungarian and in German, according to the contemporary curriculum. József Hoffner, Director and Professor of the school from 1826 to 1841, combined pathological anatomy and physiology to one independent subject which was taught over 20 months of the then 24-months veterinary training course.

With the autonomy of the veterinary school in 1851, a Chair was founded for teaching in anatomy and physiology. Its first Head, Alajos Szabó (1818–1904), Doctor of Medicine (1845) and a veterinarian (1846) from 1857 gave five lessons a week in these subjects throughout the then two-and-a-half-year veterinary course, and was author of the first textbook of veterinary anatomy written in the Hungarian language; this comprehensive textbook, printed on 573 pages with 197 illustrations, was published in 1877.

The appointment of Béla Nádaskay (1848–1933), anatomist, as Lecturer of Anatomy (1870) and later (1887) as Head of the Department, opened up new scopes of demonstrative teaching, owing to Nádaskay's extraordinary artistic talents. His anatomical drawings, life-size oil paintings and sophisticated corrosion preparations of the middle and inner ear were greatly appreciated both home and abroad. He is regarded as founder of the anatomy museum of the school. In 1900, he was awarded the gold medal of the Paris World Exhibition for an equine bronchial tree modelled from caoutchouc. As a professional writer, B. Nádaskay founded, edited and published the first Hungarian Veterinary periodical (Veterinarius, 1878). He was charter member (1880), secretary and later president, of the Hungarian Veterinary Association. He wrote several textbooks on the gross morphology, anatomy and physiology of domestic animals (1877), with special emphasis on the anatomy of the viscera of cattle and horses (1894–1895).

A bust of B. Nádaskay, erected in the park of the university campus in 1939, keeps his memory alive to the grateful posterity.

B. Nádaskay's co-worker, Gyula Szakáll (1872–1903), elaborated, on behalf of the Anatomical Congress of Berlin, the first nomenclature of avian

anatomy, in 1895, and wrote the first manual of avian anatomy in Hungarian in 1897.

Nádaskay's successor, Ágoston Zimmermann (1875–1963) distinguished himself as a lecturer by extraordinary rhetorical powers, vast knowledge and meticulousness; he combined teaching with examining at demonstrations. On his instigation, the research activities of his staff were expanded to various topics of descriptive, comparative and applied anatomy, embryology and histology, which were investigated with the collaboration of young scientists working in his department for their Doctor of Veterinary Medicine degree or a fellowship. The theses sponsored by Á. Zimmermann disclosed new aspects of the natural history of the domestic cat, rabbit, canary and grass parakeet. Outstanding research work was also conducted on the functional morphology of the foot of the horse, the stomach and mammary glands of ruminants, and on the cardiac impulse generating and conducting system.

Á. Zimmermann's textbooks were used by the veterinary students for decades; his Anatomy (1920, 1923, 1939), Embryology (1917, 1922, 1945) and Atlas of Anatomy (1922, 1942) were published in several editions.

During his professorship in the veterinary school, he was entrusted with educational responsibilities in other institutions of higher learning as well. For several years he headed the Department of Zoology of the University of Science of Budapest, lectured in comparative embryology, and introduced the students of agronomy to the anatomy and physiology of domestic animals. He held the post of Rector in the Veterinary School in 1933/34, and in the József Nádor University of Technology and Economics in 1939/40. The Hungarian Academy of Sciences elected him Corresponding Member in 1922, Member in 1934, and Honorary Member in 1942. He was Honorary Member of the Royal College of Veterinary Surgeons (London), and for long years President, later Honorary Member, of the Hungarian Natural Scientist Association. He held several high awards including the Kossuth Prize (1957). His bust was erected in the park of the university campus in 1975, on the 100th anniversary of his birth. On the same occasion, the primary school of his native town Mór founded an Á. Zimmermann Memorial Medal, and a permanent exhibition on the events of his life.

Professor Gyula Kovács (1899), head of the department from 1947, held parallel courses in anatomy, embryology and histology, with special emphasis on the practice-oriented outlook. He established a histology unit in the Department, and introduced X-ray techniques for veterinary anatomical studies; for a thesis based on X-ray anatomy, he was awarded the higher postgraduate title "Doctor of Veterinary Science" in 1959. His book on the radiographic anatomy of the equine tarsus, published in English, was esteemed internationally.

Gy. Kovács was the author of excellent textbooks. His Atlas of Anatomy was published in four editions (1952, 1956, 1965, 1967), his Embryology

(written in co-authoship with Gy. Fehér) in three editions (1954, 1966, 1973), and his Anatomy of Domestic Animals in two editions (1959–1961, 1962). He had a special interest in the history of veterinary education in Hungary, and wrote a book about it in co-authorship with Gy. Fehér (Biographia, 1968).

From 1967, György Fehér (1928), livestock production engineer (1951) and Doctor of Veterinary Medicine (1960), headed the Department. Initially he had been in charge of teaching embryology; he gradually added to the content of the course, recent advances in molecular biology and reproduction biology. In 1968, regional anatomy was integrated into the framework of the main discipline as an independent subject, and Gy. Fehér presented the first diagnostically-oriented textbook in Hungarian on regional anatomy (1971). His other textbook, "Functional Anatomy", was published in three volumes in 1980. The teaching staff of the department has done its best to raise the standards of teaching in anatomy and related subjects by utilizing the newest methods offered by education techniques.

Gy. Fehér has held honorary offices in several home and foreign scientific societies of veterinary anatomists; among others he has been Vice-President of the European Association of Veterinary Anatomists from 1975.

Histology

Alajos Szabó had given lectures in histology from 1846 on; his textbook discloses that he had approached physiology as a branch of functional morphology.

The development of veterinary histology had begun with the promotion of veterinary physiology to an independent discipline in 1872. The teaching of physiology had been assigned to Professor Lajos Thanhoffer (1843–1909), who had been the first to hold a regular course in histology. He established at his Department an up-to-date research laboratory. He wrote fundamental research reports on the tissue structure of the cornea (1873), intervertebral ganglion cells (1878), and nerve terminals of the striated muscles (1881). His well illustrated textbook on comparative physiology and histology (1883) had long been a valuable aid to veterinary students. In 1890, L. Thanhoffer left the veterinary school for the Chair of Anatomy in the Medical Faculty. In his capacity as a medical professor he wrote the first manual of histology in Hungarian, and a guide book on histological techniques.

Following Thanhoffer's change of position, the course in histology had been taken by Géza Farkas, Head of the Department of Physiology from 1903 to 1922. During his professorship Kálmán Tellyesniczky, Doctor of Medicine, Honorary Professor, participated in the teaching, then he, too, left the veterinary school for a professorship in the Medical Faculty. Tellyesniczky

centered his research interests mainly on the chemical and physical aspects of histological fixing techniques; he contributed a chapter on fixing and fixing solutions to the German manual "Encyklopädie der mikroskopischen Technik".

From 1922 to 1930, Sándor Abonyi, renowned zoologist, Honorary Professor of the veterinary school, lectured in histology. Another lecturer, András Szüts, was also in charge of teaching histology. G. Farkas's successor in the Chair from 1922 to 1948 was Dezső Deseő, who lectured in histology from 1930. From 1948, teaching of histology was referred to the Department of Anatomy. Professor Gy. Kovács founded an independent unit for histology and entrusted János Guoth with its teaching. From 1957 to 1978 Ernő Guzsal served as Reader in histology, and since 1978, Ernő Tury has been in charge. Histological research has been conducted in a broader scope since the middle 'fifties; J. Guoth initiated experimental histology, and E. Guzsal performed electron microscopic and histochemical investigations into various topics of veterinary histology. E. Guzsal was author of textbooks on cytology and histology (1963, 1967) which represented an up-to-date functional outlook of the discipline. His book was revised in third edition by E. Tury (1974).

Embryology

Records on teaching embryology in the framework of the main discipline of zoology have been available since 1850. B. Nádaskay had frequently referred to embryological aspects in this textbook on anatomy. From 1893 Ferenc Tangl, from 1906 to 1911 Kálmán Tellyesniczky gave lectures in embryology, and Á. Zimmermann developed it to an independent subject during his professorship from 1912 on. The course in embryology had then extended over two terms, and Á. Zimmermann contributed the first textbook of veterinary embryology in Hungarian in 1917 (re-edited in 1922 and 1945). Professor Gy. Kovács also promoted the development of the subject and in co-authorship with Gy. Fehér, wrote the successive textbook of embryology, which was also published in three editions (1954, 1966, 1973).

Futher development followed during Gy. Fehér's professorship (1968), owing to integration into embryology of the newest advances in molecular biology and reproduction biology. Progress in embryological research evolved from investigations into the causes of congenital malformations, inhibiton of development, growth of domestic birds, and development of the yolk sac, foetal envelopes and certain organs of birds. Electron microscopic, histochemical and biochemical examinations were introduced as new methodical approaches. Collaborative research has been conducted with other institutions, mainly on different aspects of the functional morphology and development of the do-

mestic goose, with special regard to the biology of hatching. The results of examinations have elucidated the ultrastructure of the lymphatic system, of the foetal envelopes and the developing allantoic sac, as well as details of the nutrition of the goose embryo.

Department of Animal Husbandry

General and special animal husbandry, genetics, biometry

I. Sándor

Although teaching of animal breeding and management has been on the training programme of the Budapest veterinary school from the beginning (its founder, S. Tolnay, and his immediate successor J. Hoffner, had already given lectures on the external characteristics of the main livestock species and on horse breeding), the expansion of the discipline followed only after the adoption of the Darwinian doctrines by Vilmos Zlamál (1803–1886), who rendered great services to the development of this discipline. Zlamál's deputy, Márton Galambos (1820–1872), had initially lectured on the "natural history" of domestic animals and on the art of veterinary obstetrics, which had then been termed animal husbandry. Later, with the adoption of Darwin's conception, the natural history, dietetics and characterization of domestic animal species, which had formerly been taught as independent subjects, were united into a single discipline, animal husbandry whose fundamental aspects were outlined for the first time in the Hungarian language in Zlamál's manual, published in 1861. While animal husbandry evolved to an independent branch of science, veterinary obstetrics gradually became detached and started a disciplinary development of its own.

The year 1873 marked a milestone in the development and teaching of animal husbandry in this country. The fact, that the first Department for this discipline was founded in the veterinary school in this year, symbolized the prominent role of animal husbandry in veterinary medicine, a role which continued to have its implications up to the present.

Béla Tormay (1839–1906) was appointed Head of the newly founded Department, and first Hungarian professor of animal husbandry. He had graduated at the contemporary schools of agricultural engineering and veterinary medicine — during his preceding career, as teacher of the agricultural school of Keszthely, and later as director of the agricultural school of Debrecen, — he had written several important manuals on general aspects of animal husbandry (1871) on breeding of the working horse (1872) etc., which had rendered him eligible for the first chair of animal husbandry. With Tormay's

appointment to that chair, livestock production on a natural scale gradually came under a veterinarian's guidance. In 1880, B. Tormay was assigned to found the Department of Animal Husbandry in the Ministry of Agriculture, Industry and Trade. He headed that department under several successive governments and served also as Director General of all agricultural secondary schools and colleges in Hungary (1886). He took responsibility for importing breeding stock and organizing the first animal breeding and dairy board in the country. He was promoted to Deputy Minister in 1901. He advocated the veterinary control of animal husbandry and recruited the best veterinary scientists of the country to improve the conditions of contemporary livestock production. In all five agricultural academies under his control he assigned teaching of animal husbandry to veterinarians. In cooperation with veterinary scientists trained by himself and, in due course, with the entire body of veterinarians, he gradually managed to tighten veterinary control of the national livestock production schemes. This necessitated an expansion and intensification of the course in animal husbandry and in related topics at the veterinary school. Tormay took charge of providing the necessary literature, and also published extension-type papers on actual livestock production targets. In appreciation of his merits in improving livestock production, he was elected Corresponding Member of the Hungarian Academy of Sciences in 1902. Many foreign scientific societies and institutions also awarded him honorary memberships, distinctions and titles.

After B. Tormay had left the chair of animal husbandry for his high post in the Ministry, Károly Monostori (1852–1917) was appointed his successor (1884), and in the capacity of full Professor (1888). After his graduation in 1874, Monostori had first joined the Department of Physiology, then became assistant to Professor Tormay. For several years he had been on the staff of the Animal Health Department of the Ministry, and served in that capacity as fully authorized officer in charge of the eradication of the last outbreaks of rinderpest in this country.

A dedicated darwinist, K. Monostori advocated in his lectures the importance of genetic selection and the development of new livestock breeds. He subdivided the content of his disciplinary programme into lines of zoomorphology, ecology, species characteristics, dentition, nutrition, and breeding of the various animal species. He wrote treatises on various aspects of each of these lines. To improve demonstration, he engaged the excellent sculptor György Vastagh, Jr. to create a collection of sculptures of the contemporary breeds of livestock and poultry.

As a professional writer, K. Monostori distinguished himself as an encyclopaedist, and founder of the Hungarian professional literature on animal husbandry, to which he regularly contributed important papers from 1885 on. He retired holding the title of Privy Councillor in 1908.

Monostori's successor, Oszkár Wellmann (1876–1943) headed the Department from 1908 and was appointed ordinary professor in 1910. He had graduated from the Budapest veterinary school in 1895, and was one of the first three awardees of the title "Doctor of Veterinary Medicine", which had been granted in Hungary for the first time in 1907. He started his career as Assistant Professor in the Department of Physiology, and attended simultaneously the courses of the seventh term of the medical school. His 30-year teaching career in animal husbandry goes down in veterinary history as an epoch of reforms in which the scientific foundations of the discipline were renewed. Wellmann expanded the scope of animal husbandry to biochemical, genetic and experimental biological aspects which, along with other topics, were intensively investigated in his department, with special regard to application of recent advances in science to the practice of animal husbandry. His metabolic studies promoted the control of infertility, and his research into rickets, conducted in collaboration with J. Marek and L. Urbányi (1930–32), ultimately led to an appreciable reduction of rearing losses. Wellmann introduced cattle testing and the herdbook system on a nationwide scale. He utilized the experience obtained by research and organizer activities to expand the training programme of animal husbandry, which developed in his hands to one of the main disciplines of veterinary education. He summarized his research results in several textbooks, which were available to his students from 1921 on.

O. Wellmann held the post of Rector of the school for two years, he was Ordinary Member of the Hungarian Academy of Sciences (1937), and a Member of Parliament. The governments of Turkey (1932) and Iran (1936) invited him to advise them on the modernization of livestock production.

After Wellmann's death, József Schandl took over lecturing in animal husbandry for nearly one academic year.

József Schandl (1885–1973) graduated in agriculture (1906) and veterinarian (1909), had read for the degree "Doctor of Veterinary Medicine" as Wellmann's coworker, and served subsequently as head of the Animal Husbandry Department in two agricultural academies (Kolozsvár and Magyaróvár). His veterinary diploma, his early teaching career in the veterinary school, where he had lectured in "Encyclopaedia of Agriculture" (1919–1922), and his assignment as examiner of veterinarians qualifying in state veterinary medicine, had linked him with the veterinary profession from the beginning. Still closer connections arose from his lecturing assignment in the veterinary school in 1943–44. His excellent textbooks on various aspects of animal husbandry were long used in veterinary training. In appreciation of his merits, J. Schandl was Corresponding and Ordinary Member of the Hungarian Academy of Sciences, and was awarded the Kossuth Prize and several other high governmental distinctions.

In 1944, Zoltán Csukás (1900–1957) was appointed Professor and Head of the Department. Having acquired in addition to his diplomas in agricultural sciences (1922) and veterinary medicine (1927) a third degree in economics (1935), Z. Csukás approached his teaching and research responsibilities from a most profound knowledge, however with a keen sense for the practical aspects. His activities as teacher of animal husbandry in two agricultural academies (Magyaróvár and Debrecen) and finally in the veterinary school, have led to important and lasting developments in several fields of livestock and poultry breeding and nutrition.

His appointment as Head of the Cattle Breeding Department of the Agricultural Research Centre opened up new scopes for research. He identified and collected high-yielding cattle families of long productive life span and solid constitution for further breeding. His investigations into the objective criteria of breeding value laid down the foundations for the introduction of progeny testing on a national scale. With Z. Csukás in the Department of Animal Husbandry, this school remained the leading centre of livestock production of a further 13 years. In recognition of his achievements, Z. Csukás was awarded the Kossuth Prize (1954), and was elected Corresponding Member of the Hungarian Adacemy of Sciences (1954). After his untimely death, he was succeeded by József Márkus, who had been his coworker since 1951.

Preceeding his appointment to the chair, József Márkus (1911), graduate of agriculture (1935), had been on the staff of the Agricultural Research Centre (1949) and of the Research Institute for Animal Husbandry, respectively. He contributed to organizing the latter and had, for one year (1950), served as teacher of animal husbandry in the University of Agricultural Sciences of Gödöllő. His favourite field was sheep husbandry, but he also contributed to cross-breeding of cattle. He founded in the Department in the veterinary school a blood group research unit to raise the scientific standards for breeding activities.

In 1963, a new Department, of Animal Nutrition, was detached from the original Department of Animal Husbandry, with J. Márkus as its first Head, and Artur Horn (1911) was appointed Professor of Animal Husbandry. A. Horn a graduate of agriculture (1934) had served for 30 years as research associate and Professor of Animal Husbandry in the Agricultural Universities of Keszthely and Gödöllő, then for a further 17 years in the Animal Husbandry Department of this University. His invaluable contributions to advances in his chosen field have been appreciated both at home and abroad. He introduced teaching of population genetics, and developed several new dairy cattle breeds. His work in applied genetics and, especially, in cross-breeding, has won him international reputation. He was frequently invited to lecture at international conferences, was called in as advisor on livestock breeding policy by many countries, and also by the FAO for three years. The textbooks and manuals written or edited

by A. Horn have been used by students of veterinary medicine and livestock production science for two decades. A favoured and indefatigable lecturer, he also took a major share in veterinary postgraduate education.

A. Horn holds honorary and administrative posts in several international organizations, and several foreign univesities awarded him the title of Honorary Doctor. He was elected Corresponding (1961) and Ordinary Member of the Hungarian Academy of Sciences (1967) and was awarded the State Prize in 1978.

After the retirement of A. Horn in 1980, his former student and co-worker, János Dohy (1934) succeeded him in the chair. J. Dohy, livestock production engineer (1957) by profession, had been on the staff of the Department—with interruptions—for 14 years. He had joined it in 1964, after an initial research associateship in cattle production, and left it temporarily, for six years, for a teaching post in the Agricultural College of Kaposvár, to return as A. Horn's successor. His research interests have been centered on applied genetics and cattle production, and his contributions have been widely appreciated. Having been of Horn's school, he has continued and creatively developed the achievements of his great predecessor. His textbooks and research reports are important contributions to current literature on animal husbandry. He was awarded the higher postgraduate degree "Doctor of Science" in 1983, and has lectured at international conferences, and has held offices in several home and foreign professional organizations and societies.

After J. Dohy left the chair for another one in an agricultural university in 1984, another past student and coworker of A. Horn, Imre Bodó (1932) was appointed Head of the Department. I. Bodó took his degree in livestock production engineering in 1956, and worked subsequently for nearly 20 years as livestock production engineer in several large farms. However, in the meantime he also pursued his research interests in horse breeding, and joined the Department of Animal Husbandry on A. Horn's invitation in 1975. He has been utilizing his vast practical experience, acquired during his farm work, research activities and on many trips abroad, to optimalize the theoretical and practical aspects of his chosen discipline in the fields of teaching and research.

Courses in animal husbandry are held for the veterinary students in the fourth, fifth and sixth term, and cover general and special aspects of livestock production with regard to livestock and poultry species of economic importance. Added to the lectures are class practicals and field courses in large farms. Animal husbandry is continuing to form an important part of the curriculum of veterinary education, to the same extent as has been traditional for the last hundred years.

Biometrical course

Its aim is to make known the use of the statistical methods suitable for processing data from the zootechnical and veterinary practice as well as to make possible the correct biometrical understanding and interpretation of the technical literature. The following topics are covered: types of distribution and mean, standard deviation and standard error, statistical hypothesis testings, linear regression and correlation.

Department of Animal Hygiene

Animal hygiene, protection of the environment, labour safety

F. Kovács

Animal hygiene

The Department of Animal Hygiene was founded in 1962, but the discipline itself had evolved much earlier, in close connection with the development of animal husbandry and animal disease control. A governmental decree issued in 1768 had already pointed out the role of poor environmental conditions in the spread of infectious and epidemic diseases, and in increasing morbidity and mortality rates.

In Hungarian veterinary literature, the first references to the ecological aspects of livestock husbandry date back to the middle of the nineteenth century. Vilmos Zlamál, who had been director of the Veterinary Institute in Pest from 1843, centered his scientific and teaching activities on the *prevention* rather than therapy of disease, having lectured on the various measures that should be taken to conserve the health of livestock by supervising the pasture, feed and drinking water, or, as referred to by the current terminology, by *environmental hygiene.*

In the last trimester of the nineteenth century and in the early twentieth century, outstanding scientists with a broad outlook in natural and medical sciences had occupied the chairs in this institution. One of them, Oszkár Wellmann, based the teaching of animal husbandry, livestock nutrition and health on the profound knowledge acquired in colleges abroad, and thereby raised these formerly mainly empiric subjects to the level of a scientifically founded discipline. His scientific outlook led him to recognize the *importance of the interaction between the living organism and its environment*, and to advocate the appropriate rearing of the *young*, *economic* nutrition, good housing and care of adult animals as "efficient means" for the development of livestock husbandry.

Progress in genetics led to the intensification of livestock production and management. Zoltán Csukás regarded the results of the section for economically useful traits inseparable from appropriate management and feeding, which, in his view, were the main prerequisites of *health* preservation. He saw the basis of *economic* livestock production in the unity and interdependence of the genetic potential and the ecological factors (management, feeding, attendance).

In the 'fifties and 'sixties, with large-scale livestock production an urgent demand arose for control of the microclimate in animal and poultry houses, analysis of interrelationships between the quality of flooring and disease, and heat and humidity circulation as well as ventillation. The contributions of János Köves, Géza Bocsor, Tamás Ádám and Iván Szép to these aspects of veterinary hygiene deserve special mention.

János Mócsy, professor of Clinical Veterinary Medicine, in 1953 proposed the teaching of Animal Hygiene as an independent subject. Lecturing in the new subject was assigned to Iván Szép, Chief Veterinary Scientist, appointed Reader in Animal Hygiene from 1954. Lectures in Animal Hygiene three hours a week at the end of the 10th term were prescribed for end-term examination in the same year. To promote this a textbook, embracing all multidisciplinary aspects of animal hygiene, was written by Mócsy and Szép in 1959 under the title "Animal Hygiene". A Polish translation of this book appeared in 1964. Iván Szép was appointed Professor of Animal Physiology and Animal Health in the University of Agricultural Sciences of Gödöllő in 1959, and continued research work in the field of animal hygiene and health.

By decision of the University Council, an *Animal Hygiene Working Group* was established under the auspices of the Department and Clinic of Medicine in 1961, with Ferenc Kovács, Reader as its Head.

One year later by a decree of the Minister of Agriculture in 1962, the *Department of Veterinary Hygiene was formed* with Ferenc Kovács as its Head.

Ferenc Kovács obtained his diploma of Veterinary Medicine in 1952. From his graduation until his appointment as Head of the Animal Hygiene Department in 1962, he had been on the staff of the Department and Clinic of Medicine. In addition to teaching and research engagements, he has collaborated in the direction of the school with a short interruption for 25 years. having acted as Deputy Rector from 1961 to 1972, as Rector from 1972 to 1978, as Deputy Rector again until 1981, and as Rector again from 1984 on.

The facilities offered by the newly founded Department for intensive research were utilized for accelerating the extension and advancement of the evolving discipline. Three up-to-date *climatic chambers* equipped with the newest facilities, the first of its kind in Central Europe, were established under the auspices of the Department for the purpose of basic and development-oriented applied research. Within the Department a research group supported by the Hungarian Academy of Sciences was established.

Results of an intensive research work laid down the foundations of an up-to-date *course in animal hygiene*, and provided for continuous new teaching material. The appreciation of animal hygiene is reflected by the fact that its teaching was extended over two terms (the ninth and tenth term), in four formal lectures and two practical classes a week, and became part of the final state examination.

Last term students are allocated to a field course in animal hygiene in a large livestock production unit before sitting for the state examination.

International professional contact has been fostered by the Head of the Department from the beginning. On his instigation the *International Society for Animal Hygiene was founded in 1970 in Budapest*, with Ferenc Kovács elected as its first president. The *First International Congress of Animal Hygiene*—first in the succession of similar meetings held, according to the decision of the Council of the Society and the Preliminary Statues every third year—was held *in Budapest in 1973.*

During the period of office as Rector of Ferenc Kovács the reconstruction of the University campus was realized, which contributed among others nine new *climatic chamber systems* with appropriate laboratory facilities to promote progress in animal hygiene. In addition to the *Working Groups for Environmental Physiology* and *Applied Microbiology*, a third working group was established in the Department. Investigations into problems of environmental physiology have had twelve climatic chamber systems, available to all farm animal species, resulting in certain important *discoveries of international priority*.

Ferenc Kovács has published research papers partly in foreign languages — numbering 150. He wrote two textbooks, two manuals, and contributed parts or chapters to three textbooks published in foreign languages. His textbook entitled "Animal Hygiene", first published in 1975, was awarded the "Best Book Prize" and was approved by the Ministry of Agriculture and Food for the use of undergraduates of all of agricultural sciences faculties. A second revised and extended edition of the textbook was published in 1980.

The organizational activities of the Head of the Department of Animal Hygiene have promoted the establishment of a *hygienist network* in the frame of the national animal health service, and the development of extension training facilities leading to postgraduate *specialisation in animal hygiene* — in brief, the evolvement of *a school of animal hygiene*. The volume entitled "Pig Farmer's Manual", edited by Professor Kovács in 1984, and awarded the "Best Book Prize" of that year, was also written to introduce the wider professional body to a *hygienist outlook* in intensive pig farming.

Ferenc Kovács in 1976 was elected Corresponding Member, in 1982 Ordinary Member, of the Hungarian Academy of Sciences. He has long been engaged in science policy as a Member of the Commission for Postgraduate

Qualification of the Hungarian Academy of Sciences, President of the Editorial Board of the Hungarian Veterinary Journal "Magyar Állatorvosok Lapja", and Chairman of the Animal Hygiene Section of the Society of Hungarian Veterinarians (affiliated to the Hungarian Agricultural Association). He holds several state and social awards; in 1983 he was awarded the State Prize.

Three foreign schools of veterinary sciences (Veterinary College of Hannover, FRG, 1978); Veterinary College of Kosice, Czechoslovakia, 1984; Vienna University of Veterinary Science, Austria, 1985) awarded him the title of Honorary Doctor *(doctor honoris causa)*. He was elected Honorary Member of the International Society for Animal Hygiene in 1976, Corresponding Member of the German Veterinary Society (FRG) in 1985, and he holds the Memorial Medals of several professional bodies.

Protection of the environment. Labour safety

The artificial environment created by mankind to satisfy its increasing needs for civilization (urbanization, industry, agriculture, trade, traffic, etc.) not infrequently elicits irreversible changes, which are hazardous to human health, above all by the pollution of air, soil and water.

With the spread of the intensive systems of agricultural production, agriculture has itself become an environmental pollutant. In Hungary, special emphasis has been laid on protection of the environment, owing to the particularities of agricultural production, such as plant production in monoculture over large areas, concentration of stock, and integration of large- and small-scale production systems. The intensive systems have, apart from their well-known advantages, the disadvantage of an increasing pollutant effect on the environment.

The control of environmental pollution has been regulated in Hungary by the Environmental Protection Act issued in 1975. This Act has, among others, prescribed the teaching of protection of the environment in institutions of higher education. In this University, introduction to environmental protection and labour safety has been integrated into the curriculum since 1978. The course in these subjects has been in charge of the Department of Animal Hygiene, and has been tutored by F. Kovács and P. Rafai. It is hold in the tenth term, in two lectures a week, and is prescribed for end-term examination. Instruction in environmental protection and labour safety has also been added to the curricula of the postgraduate training course in charge of the University.

The contents of the course cover the following aspects, by a synthetic approach: general aspects of environmental protection in agricultural production systems; veterinary and public health interrelationships of environmental pollutant effects in the food chain (soil-plant-animal-man); impact of residues

present in foods of animal origin on human health; protection of the environment in large-scale livestock production systems; sources of the pollution of air, soil and natural waters with special regard to impact on human health; environmental protecton measures in the abattoir with regard to carcases and abattoir by-products; veterinary and public health relationships of the utilization of liquid manures; possibilities for the prevention of zoonoses; precautions in the handling of agricultural machinery and animals; legal provisions of labour safety at legislational and trade union level. The principles of the discipline are laid down in a special chapter of the textbook "Animal Hygiene" (F. Kovács, 1980).

Research on topics of environmental protection is also conducted in the Department of Animal Hygiene, in charge of G. Tamási. The microflora of liquid manures, and the survival of microorganisms in these, has been determined, air pollution resulting from superficial irrigation with liquid manure has been measured, methods were elaborated for the detection of foul smelling components in the ambient air of animal houses, and an aerosol preparation was developed for the deodoration of stable air.

Based on year-long, tenacious investigations along these lines, the coworkers of the Department elaborated for the FAO member countries recommendations for hygienic measures in liquid manure disposal and utilization. The FAO approved the recommendations in 1985, and, since the same year, the Department has been assigned by the FAO to serve as the centre of Sub-Network 1 of the FAO Network on Animal Waste Utilization.

The Department of Animal Hygiene has been, in cooperation with a research group of the Central Veterinary Institute (A. Ványi and colleagues), in charge of a research project covering investigations into the damages of moulds and of mycotoxicoses in the food chain in general, and in its stages (soil-plant-animal-man) in particular.

Department of Animal Nutrition

General and special aspects of animal nutrition

J. Bokori and S. Fekete

The discipline Animal Nutrition evolved in the Budapest veterinary school essentially in three stages. (1) From the school's foundation in 1787 until 1873, the preclinical curriculum included "dietetics" as a minor subject. (2) From 1873 to 1951, introduction to "animal nutrition" was integrated into the course in animal husbandry; from 1951 to 1963, the general aspects of

animal nutrition were referred to an independent course, whereas its special aspects were still combined with the teaching of animal husbandry. (3) In 1963, the Department of Animal Nutrition was founded, and its staff took charge of a two-term course on feedstuffs and general nutrition science. Since 1974, introduction to the special aspects of livestock nutrition (i.e. the nutrition of various animal species) has also been separated from the training programme of the Department of Animal Husbandry and referred to the competence of the Department of Animal Nutrition.

The biographical data of the professors who have served as lecturers of animal husbandry from 1878 to 1963 are described in detail in the historical chapter of this volume and/or in the short reviews on the development of the departments.

The first curriculum of the school, developed by its founder Sándor Tolnay (1748–1818), had covered among other disciplines the subject "dietetica" from the beginning. Among S. Tolnay's successors who were in charge of introducing dietetics for shorter to longer periods (Román Brunkala, György Kozarics, József Hoffner, Vilmos Zlamál, Márton Galambos, Ferenc Kudlik, Ferenc Varga) Vilmos Zlamál and Ferenc Varga were the first to include information on dietetics in their textbooks published in 1861 and 1872.

The foundation of an independent Department for the teaching of Animal Husbandry in 1873 speeded up the development of nutrition science, which was included in the training programme of that Department along with gross morphology, knowledge of species, knowledge of dentition, general and special animal husbandry, and parturition assistance. The course in general nutrition science lasted for one term with three lectures and two-hour practicals every week, that in special nutrition science for two terms, with the same time devoted to lectures and practicals.

The first Head of the newly founded Department was Béla Tormay (1839–1906); during his professorship (1873–1888) all disciplines in charge of the Department, including nutrition science, were raised to the highest contemporary standards. Tormay's book published in 1902 gives an insight into contemporary approaches to animal nutrition. It described not only the various feedstuffs, but also their preaparation, possible falsification, and analysis. Obviously, much valuable information had been accumulated on these topics around the turn of the century, but objective approaches to precise measurements (i.e. feed units) had been lacking. Thus Tormay in his book dealt mainly with the dietetic effects of feedstuffs and with possibilities of preventing pathological conditions due to dietary errors. He almost seems to have divined the existence of mycotoxins; in his book he commented on groundnut cakes as follows: "... degradation products hazardous to the health of animals are formed in the spoiled and mouldy cakes". A still remarkably up-dated economic outlook prevades all statements in Tormay's book.

Tormay's successor, Károly Monostori (1850–1917) did not himself contribute to the development of nutrition science by original research, but carefully followed and applied recent advances in its field. His book written on horse breeding in co-authorship with Béla Kovácsy (1889) and his reports disclose that animal nutrition was no longer based on empirism alone by the end of the past century. Monostori recognized the importance of the knowledge of chemistry for solving problems of nutrition. The above book deals among others with feed rationing, dietary levels of organic matter, digestibility of proteins, carbohydrates and lipids, and utilizes the term "Nutritive Ratio" for designation of the protein-energy relationship of feeds and ratios.

K. Monostori was anxious to adapt the content of nutrition science courses to advances in the discipline. He did not extend the training period described for lectures and practicals, but added field training in livestock farming units prescribed from the academic year 1904/1905 onward, to the disciplinary programme of his Department.

Another professor of the contemporary veterinary school, Ferenc Tangl, Head of the Institute of Physiology from 1892 to 1903, showed great interest in nutrition research. He established the Royal Animal Physiology and Nutrition Research Station and with his co-workers conducted fundamental investigations into various aspects of animal nutrition and metabolism. He determined the composition and nutritional value of the currently used fodders and compound feeds, and furnished thereby the conditions of feedstuff industry on a country-scale. His pioneer investigations into metabolic processes won him an international reputation; he used farm animals instead of laboratory animals in the studies. One of Tangl's co-workers, István Weiser, Titular Professor of Feed Chemistry, from 1904 to 1933 held an optional course (two lectures a week over two terms) on that topic; the analytical, biochemical and digestion physiological aspects of nutrition science, covered in Weiser's lectures, were complementary to the basic course held under the auspices of the Department of Animal Husbandry.

After K. Monostori's retirement, Oszkár Wellmann (1876–1944) was appointed Head of the Department of Animal Husbandry (1908–1944). The course in animal nutrition was not extended during his professorship. His research interests were centered on the biochemical aspects of energy metabolism and electrolyte turnover. His fundamental investigations into the etiology of rickets, performed in collaboration with József Marek, were described in a two-volume monograph published in both Hungarian and German (1930–1932). With his co-worker in chemical analytical studies, László Urbányi (later Professor of Chemistry in the school), Wellmann studied among others the impact of dietary mineral supplies on the Ca, P and total CO_2 levels of the blood serum, the interrelationships between the dietary ratio and utilization of vitamin D and minerals, the impact of mineral supplies on the feed utiliza-

tion of piglets, etc. Wellmann extended his metabolic studies to poultry, rabbits and dogs. He determined the Ca, Mg and P contents of the main feedstuffs, and, with his staff, examined certain inorganic iron and copper compounds for biological effects. He pioneered investigations into the influence of certain feed constituents (carbohydrates, lipids) on mineral metabolism. He pursued successfully the practical application of his achievements in basic research.

Wellmann's successor, Zoltán Csukás (1900–1957) headed the Department of Animal Husbandry from 1946 to 1957. From 1951, the teaching of nutrition science was referred to an independent course (three lectures and two-hour practicals a week, during the fourth term), which was concluded by an end-term examination, and was completed by an inter-term (summer) field course.

The veterinary approach to nutrition science was creatively developed by Professor Csukás. The broad scope of his research interest covered among others the impact of light on the metabolic rate, seasonal fluctuations in avian metabolic rate, impact of grazing on the composition of cow's milk, maintenance and production rations for dairy cattle, the role of vitamin A or carotene deficiency in the infertility of hen's eggs, cows, etc. The textbooks and manuals written by Professor Csukás reflect a comprehensive biological outlook, rich personal experience in all aspects covered, and familiarity with the international veterinary literature. His manual on animal nutrition, one of the best contributions, was published in two editions (1952, 1956), and is still not obsolete; the facts and conceptions advanced in it might need supplementation, but no revision.

Z. Csukás was succeeded in the Chair by József Márkus (1911), who served as Professor of Animal Husbandry from 1957 to 1963.

Since the importance of nutrition science increased steadily with the speedy development of large livestock production systems in Hungary, an independent Department of Animal Nutrition was founded in the University of Veterinary Science in 1963, and Professor J. Márkus was assigned to serve as its first Head. With the reorganization of the University's training scheme, the course in animal nutrition was extended to two terms from the academic year 1964/65 onward.

In the research field, Professor Márkus and his staff pursued mainly applied aspects of nutrition science, such as interrelationships between dietary trace element supplies and microbial and plant protein synthesis, and optimal composition of compound feeds. Areas with manganese-deficient soils were mapped by fundamental investigations. The E-DMP-Lys procedure was introduced for feed evaluation and various problems of protein and amino acid analysis were clarified.

After the retirement of Professor Márkus, the course in animal nutrition was temporarily in charge of invited lectures; Sándor Szentmihályi, Director

of Research, Research Centre for Animal Production and Nutrition, held it in the academic year 1973/74, and Károly Baintner sen., emeritus Professor in 1974/75. By that time, introduction to the dietary needs of various animal species had been integrated into the course of nutrition science.

In 1974 József Bokori (1927), Doctor of Veterinary Medicine (1951) and holder of the degree of "Candidate of Veterinary Science" (1963), was appointed Head of the Department. On graduating from the school, he had joined the Department of Pathology, and from 1954 to 1973 he was on the staff of the Department and Clinic of Medicine. In the meantime, from 1970 to 1972, he served as FAO-expert in Iraq. On his return, he served as Reader in the Department of Animal Hygiene in 1973/74. He was promoted to full Professor in 1977.

Along with his studies into special topics of pathology and clinical veterinary medicine, J. Bokori had taken interest in problems of nutrition science long before his assignment as its professor. He wrote his dissertation submitted for the "Candidate of Science" degree on the pathogenesis of gout in poultry. As a nutrition scientist, he centered his research interests on the impact of the methods of fodder plant production, preservation and storage on the dietary levels of feed constituents, minerals and active substances, on new protein sources for animal feeds, and on the determination of the vitamin and trace element requirements of new breeds and their crossings. Since 1977, he has served as Coordinator of the FAO European Co-operative Network on Trace Elements. He wrote several lecture notes for the undergraduates and postgraduates and was co-author of the first textbook on veterinary pathophysiology and of another on feed contamination by poisonous plants. In his Department he directed research projects on the elaboration and adaptation of new feed analytical procedures, and on digestion physiological problems. Mention should be made of a complex analysis of the nutrient value and impact on animal health of maize stored in moist (fermentative) conditions, and of investigations into the metabolization of arsenic, fluorine, lithium, zinc and iron in different animal species. The vitamin levels of feeds, the dietary vitamin requirements of animals, the biological value of mixed animal proteins, blood and feather meals, improvement of feed digestibility, biogenic amine levels of certain feeds have also been studied. Great importance has been attached to metabolic studies on the digestibility of the main rabbit feeds, to clarification of the mechanism controlling rabbit caecotrophy, and to assessment of the roughage and protein requirements of growing rabbits.

Under the revised system of training introduced in the school since 1982/83, the course in nutrition science has been held in the sixth and seventh term (three lectures and two-hour practicals every week) and has been concluded by a closing examination in both the theoretical and practical aspects of the discipline. A two-week field course is additionally prescribed during

the summer vacation following the sixth term. This course is organized for minor groups of undergraduates in different livestock farming units, and is in charge of a local tutor in each.

Last but not least, mention should be made of the close connections maintained by the Department to various large livestock farming units, and of the assistance rendered to these in the diagnostic identification and prevention of diseases due to faulty feeding.

Department of Botany

E. Haraszti

Teaching of veterinary students in botany dates back to the early nineteenth century; Sándor Tolnay had been the first to integrate lectures on botany and agricultural plant production into the contemporary curriculum in three hours a week.

By the middle of the last century (1857–75) teaching was in charge of invited lecturers, in chronological order, Márton Galambos, Sándor Eisenmayer, Márton Galambos again, Lajos Thanhoffer and Béla Tormay, and later (1874–95) Kálmán Czakó, full Professor of Pathological Anatomy and Pharmacology, and organizer of the laboratory which had been the core of the later National Seed Grain Control Station. He introduced — preceding the foreign countries — the hay analytical practice in the veterinary school.

After the retirement of K. Czakó, Gyula Magyary-Kossa, Professor of Pharmacology, served as teacher of botany from 1896 to 1913. His successor, Zoltán Szabó, Titular Professor of the morphology and systematics of agricultural and galenic plants, lectured in botany for 10 years, and contributed to the development of the discipline by important research work. He investigated the physiology of Dipsacus spp., the weed grain status in the soil, with special regard to germination, performed comparative histological analyses of different maize species, and was also interested in genetic research. In the period 1923–1931, Oszkár Varga, scientific manager, took charge of teaching botany in the veterinary school.

His successor Bertalan Hazslinszky (1902–1966), Senior Lecturer, lectured from 1931 to 1944. He was the author, among other publications, of the textbook "Microscopic study of food items of plant origin and of fodders", which is still used by specialists. His research interests covered among others, plant poisonings in sheep (Mercurialis), horses (Hypericum and Glechoma) and pheasants (Datura).

Hazslinszky's successor Ádám Boros (1900–1973), lectured in botany from 1945 to 1953; his wide scientific interests covered many fields of botany,

from flora research to systematics, and from galenic plants and agriculturally oriented grassland and weed studies to *briology*; he was the initiator of scientifically founded briology in this country, and his research achievements in this field have been internationally recognized. His extraordinarily rich collection of plants, more than 190,000 items, was declared by the Hungarian Academy of Sciences a protected national natural reserve after his death.

The foundation of the first independent Department of Botany in 1953 was an important milestone in the development of the discipline. The foundation of the Department was prompted by expansion of the course of instruction to new aspects (above all plant physiology and ecology) of plant production under the evolving intensive system of socialist agriculture. The chair was assigned to Vidor Modor (1910–1979), who served as Head of the Department from 1953 to 1971. His main research interests were drug analysis, systematics, histology of galenic and poisonous plants, and lethal toxicoses due to feed contamination by poisonous plants.

The Department of Botany has been in charge of teaching, apart from botany, the subjects "Production under the socialist system of agriculture" (for third-year students) and "Farm management under the socialist system of agriculture" (for fourth-year students). A course in darwinism (for second-year students) was also held by the staff of this Department for a temporary period.

V. Modor was succeeded in the chair by Ede Haraszti (1918) (Reader, from 1983 full Professor; from 1964 to 1971 on the staff of the Department of Animal Hygiene). Further to botany, E. Haraszti lectured in the subject "Farm Management" with a short interruption for 30 years (1954–1984). His research interests have been centered on current aspects of grassland husbandry, with special regard to animal health, and on poisonous plants in fodders and on the pasture. He wrote seven books on this subject, such as "Poisonous and Contaminating Plants in Feeding Stuffs" (two editions—1959, 1973—with a co-author), "Sour Herbs" (1975); "Animal and Pasture" (two editions, 1973, 1977); "How to Identify Poisonous Plants" (1972, with a co-author); "Pocket-book of Plants" (1977); "Poisonous Plants, Plant Poisonings" (1985). He won the postgraduate degree "Candidate of Science" in 1966.

The Department of Botany has, from the beginning, maintained close collaborative contacts with the other Departments of the University, with the Toxicology Departments of the Veterinary Institutes, with veterinary practitioners and large agricultural production units.

Since 1952, the Department has tutored the summer practicals of first-year students in botany and fodder plant production.

The graduate staff of the Department has cooperated in several grassland research projects. In several year-long studies the physiological, ecological, etc. factors influencing the carotene levels of grasses, and the environmental

and dietary factors influencing the carotene levels of animals were identified by the members of the staff. Certain little studied mineral components of grasses (strontium, cesium) were examined for levels and effect, and the conceptions of potentially toxic components, such as nitrates and lead, were examined for impact on environmental pollution, public and animal health. The maize varieties currently cultivated in Hungary were studied by botanical and phytochemical methods, and potential new protein sources, such as lupin, broad beans, pea, etc., were investigated for growth properties. More recent investigations have been centered on detection and quantitative determination of so-called anutritive compounds, such as cyanoglycosides, certain alkaloids, trypsin inhibitors and saponins, in home fodder plants, and the factors influencing their levels. Recent biotechnical research trends have been pursued by studies into the cultivation of higher fungi on agricultural wastes, and development of fungus feeds.

Central Library

Ilona Bakonyi

Period of the foundation of the Library 1787–1873

The Central Library is as old as the school itself. This is of special importance considering that the library system of the contemporary University of Pest comprised only two collections, one in the Department and Institute of Veterinary Medicine of the University in Pest, and another in the Observatory. Judging from the still available list of books in possession of the newly founded veterinary school, the initial collection had been of considerable value.

The founder of the school, Professor Tolnay, had succeeded in bringing together, despite the opposition of the town and university authorities, an independent book collection for the use of teachers and students, "to serve the purpose of scientifically founded education".

Annual inventories available from the period 1787–1818 truly portray the development of the library during the early history of the school. Of the 224 volumes procured by Professor Sándor Tolnay, 203 volumes are still in possession of the school as selected pieces of the Central Library's historical collection. This collection comprises invaluable relics of Hungarian and European veterinary history, among others the "Mulomedicina" of Vegetius, a compendium of ancient veterinary art; the manuscript of that volume had been found in Hungary in 1528, and was published in Latin by János Zsámboki,

Hungarian humanist, in Basel in 1574. This volume has been regarded as the first item of Hungarian veterinary literature. The historical collection also comprises Carlo Ruini's famous book on equine anatomy and diseases ("Dell' anatomia et dell' infirmitá dell' cavallo"), in the original Italian edition (Bologna, 1598), and in the contemporary German and French editions as well; although the collection abounds in bibliographical rarities, Ruini's book, with its high professional standards and many artistic, anatomically impeccable illustrations, is probably its best piece.

Professor Tolnay did his best to add to the school's library the best contemporary manuals of veterinary medicine: he had procured the works of Barbaret, Bourgelat, Brougnone, Buffon, Camper, Erxleben, Gibson, Kerstinger, Krünitz, Lafosse, Lentin, Linné, Tögl, Vink, Vitet, Willburg, Wolstein, and Zehentner, within a few years of the schools's foundation. The first Hungarian textbooks and manuals were contributed by Tolnay himself, and translations by Wolstein.

Tolnay's successors, József Hoffner and Vilmos Zlamál, also attached great importance to the library, and themselves took charge of procuring books and periodicals; invoices of contemporary booksellers and publishers, held in the University's archives, to inform posterity about their purchases. From the middle of the past century, books were occasionally donated by official organizations, e.g. several times by the governor of Pest.

Period of developing a catalogue of veterinary literature (1873–1910)

Progress in veterinary science and education had promoted new approaches to the use of the professional library around the middle of the past century. The Minister of Agriculture in 1873 ordered the registration of the books and other literature in possession of the veterinary school.

The Director of the school, Professor Alajos Szabó, entrusted Béla Nádaskay, anatomist, with the well-directed reorganization of the library. Nádaskay accomplished this work soon, and reported to the Academic Board that "the library holds 970 volumes, part of which are of historical importance and value, but the greater part comprises the newest and best books contributed to the Hungarian and German professional literature in recent years".

Nádaskay rearranged the volumes of the library according to the subjects covered by the contemporary veterinary science; the subject catalogues, along with the serial numbering of the books within each subject category portray the relative proportions of contemporary literary contributions to the different disciplines. The library also held a fair range of the then current periodicals. The first Hungarian veterinary periodical was founded by Ná-

daskay himself on the 1st January 1878, probably as a result of his responsibilities as librarian.

The first directions for use of the library were also elaborated by Nádaskay. Teachers and students were free to use the library from the beginning, were lent books and were reminded of returning them, if required.

One chapter of the school's service regulations from the year 1886 dealt with the operation of the library, and with the duties of the teacher entrusted with its running and supervision. These duties tended to increase with progressing time. In 1878, the Director of the school, Béla Tormay, sought the approval of the Minister of Cultural Affairs for the location of the library and the reading room in the central building of the new premises of the school then under construction on the Rottenbiller street plot; that plan was duly executed.

In 1888, Béla Plósz took over the assignment of a librarian from B. Nádaskay, by ministerial appointment, and his successor from 1904, István Bugarszky, was the first among the teachers also acting as librarian to receive a salary for that extra work. Bugarszky's successor, Gyula Magyary-Kossa, was entrusted with the preparation of a printed catalogue, which he duly presented to the council of professors in 1902, and was acknowledged for it in the minutes of the council's session. The catalogue listed 3586 works (6352 volumes) in possession of the library in 1901. Professor Magyary-Kossa's catalogue of veterinary literature, published in 1902, still represents a fundamental work from both the bibliographical and professional points of view, for it is not simply a list of books held by the library at the turn of the century, but a reflection of the contemporary standards of veterinary science and education, and as such a volume of great historical and bibliographical value. In 1904, professor Magyary-Kossa published another work of historical importance, the first bibliography of Hungarian veterinary literature.

As an enthusiastic collector of ancient veterinary literature, Magyary-Kossa left to the library an invaluable collection of veterinary "Hungaricas", and several rare relics of foreign veterinary literature, among others J. Fayser's "Hippiatria" (Augsburg, 1576); G. B. Ferrari's "Trattato utile e necessario . . . " (Lucca, 1580); G. S. Winter's "Ross-Artzney-Kunst" (Halberstatt, 1691); the volume "Hippiater exportus" (Nürnberg, 1678); H. G. Ryff's "Confectbuch und Hauss-Apoteck" (Frankfurt, 1576); Antonius Saracenus's "De peste commentarius" (Lugduni, 1589), etc.

Gy. Magyary-Kossa and two earlier teachers of the school, Professors L. Thanhoffer and B. Nádaskay, are remembered by grateful posterity for donations of several valuable books to the library.

Years of library organization (1910–1945)

Promotion of the veterinary school to college standing and expansion of its training programme around the turn of the century had necessarily extended the circle of users of the, by then, well arranged collection of the library. Demand for space and services in the library was equally increasing, as can be read in the minutes of contemporary sessions of the concil of professors.

In 1909, Professor Ágoston Zimmermann, then in charge of the library *(custos bibliothecarius)* reported to the council that the library unit comprised apart from the stock-room two reading rooms and an anteroom (serving as garderobe and waiting room). The larger reading room, which served the students, had facilities for reading places for 36 visitors and ". . . an open-access reference library produced on recommendation of the competent teachers . . . these books must not be lent, being intended for local loan only . . Apart from undergraduates, the students' reading room had been used by 23 graduate veterinarians holding a reader's ticket."

In 1919, a Library Commission (Professor J. Marek, L. Rhorer, and Á. Zimmermann) was entrusted for the first time in the school's history with managing the affairs of the library, and György Endre Guoth, Senior Lecturer, was assigned to serve as its Head. The library stock was increased on average by 700 volumes per annum from 1902 to 1917, and numbered 17,012 volumes in 1917. Donations by persons or organizations, and books acquired by interlibrary exchange also increased the collection. From 1921, Sándor Kotlán, Lecturer and later Professor of Parasitology, served as Director of the library. In the 'thirties, affiliation of the school (then Royal Hungarian Veterinary College) to the József Nádor University of Technology and Economics called a halt to the development of the library for a temporary period, owing to conflicting conceptions on reorganization and amalgamation of the library stocks.

World War II did not spare the premises of the veterinary school; the central building housing the library was also damaged. After an official appraisal of the war damages, S. Kotlán reported in 1946, that ". . . the Veterinary Faculty possesses a library, whose stock numbered almost 40,000 volumes before the siege of Budapest. About two thirds of that collection could be saved."

Development of the library services after World War II (1945–1979)

The reconstruction of the library rooms was completed in 1948, and Károly Farkas was appointed Director of the library. Records from the 'forties, kept in the school's archives, report: "The library is very frequented, the reading room, managing 60 visitors, is full, often even crowded, every after-

noon, and this service keeps one employee busy full time." In 1951 all libraries run by universities or high schools of agricultural sciences were referred to the superintendence of a central directorate of libraries; this system of centralization speeded up development. By that time the collection numbered about 50,000 volumes and the library subscribed regularly for 140 periodicals of which about 40 were published in Hungary.

In 1953, the permanent staff of the library numbered five employees. New service regulations were issued which stipulated, among others, the advisory collaboration of a library commission recruited from the teachers of the school. The duties of the slowly increasing library staff covered book lending, readers' advisory service, supervision in the reading rooms and answering inquiries about the stock. From 1959 Loránd Marek, and from 1969 József Kurdi headed the library. In that period a list of new purchases was issued initially once, later twice a year, always in 50 copies.

The 1966–1967 issue of the Annals of the University of Veterinary Science (Budapest) for the first time refers to the extension of the library services to monthly documentation and distribution of titles of publications in selected topics of research. Soon, the annals reported collaboration of the library staff in the training of students in the use of the library, and in collecting references on given topics. These records heralded a widening of the scope of functions of the library. The first graduate librarian was employed in the unit in 1961.

A modern library in the ancient building (1979–1986)

In the 'seventies, it was increasingly recognized by the Council of the University that the library was not able to cope with current demands for information and educational assistance in the given conditions of housing and staffing.

In 1979, Prof. Dr. Dr. h. c. F. Kovács, then Deputy Rector, submitted to the Council a plan of reconstruction and reorganization of the library which was elaborated under consideration of the suggestions of the National Library Board, and of the local library staff. F. Kovács reported that ". . . the library cannot fully execute any of its duties prescribed in the service regulations, . . . but the size of two-storey building could satisfy the space requirements of a modern library, provided all its rooms are transformed for library use".

The Council of the University approved the plan of reconstruction unconditionally, and execution was started immediately. The building was evacuated for two years, during which architectural and technical reconstruction were equally completed. After J. Kurdi's retirement, Mrs. Ilona Bakonyi was appointed Director of the library.

The new organizational and service regulations of the University's Central Library, issued in 1980, already reflected the reorganization of the staff into two departments, each controlling a well defined scope of duties. The graduate staff was increased by several trained librarians with appropriate knowledge in foreign languages.

In 1980, information leaflets on current literature and the subsequent volumes of the Bibliography of Hungarian Veterinary Literature were issued again, and the training of first-year students in the use of the library, and of third-year students in collecting references, were resumed.

Also in 1980, preparations were started for the adoption of data processing techiques for the collection and distribution of information.

From 1981, the unit was qualified as a *scientific library competent for information service on a national scale.*

In 1982, the historical collection of the University, colloquially known as "the museum" was affiliated to the Central Library. The evaluation and rearrangement of the randomly accumulated, valuable material imposed a difficult task upon the library staff.

Since 1983, foreign periodicals subscribed by the library have been put out for open access to all readers, by a decision of the University Council, which also stipulated ordering of foreign textbooks and manuals. Facilities for copying and other electric devices have been considerably improved to satisfy the increasing demand for library services.

The Library on its 200th anniversary

Since its reconstruction the Central Library has occupied the entire building which had originally been designed by Imre Steindl in 1881 for housing the central offices of school. The two storey building offers a floor space of 908.43 m^2, of which 417.34 m^2 (46.5 per cent) are available for the readers's advisory service, 312 m^2 (23.7 per cent) are used as stock rooms, and 278.09 m^2 (29.8 per cent) as offices and other staff rooms.

The Veterinary Historical Collection (museum) is housed in the new building of the aula, on 144 m^2 floor space.

Ground floor. Left from the entrance is a self-service garderobe with 80 wardrobes, at right opens a large stock room with iron shelves and an elevator to lift the books to the reading rooms on the first floor.

An anteroom furnished with comfortable armchairs and tables offers an aesthetic setting for conversation and recreation; its walls are decorated with large pictures of the old school, its floor is red marble; the wrought iron railings and lamp-posts, and coloured windows are precious relics of the original turn-

of-the-century style. The rest of the ground-floor is occupied by offices and work rooms.

Upstairs almost the entire floor is for the readers' use. Six thousand volumes of the newest textbooks and manuals, and the entire stock of periodicals are displayed for open access, along with catalogues, alphabetical and decimal registers, microfilm-reader, etc. The reading rooms manage 102 visitors, i.e. about 10 per cent of the potential readers at one time; this capacity meets the usual demand of the library service. Two trained librarians are in charge of the readers' advisory service full time. Above the iron shelves mounted along the walls are the oil-painted portraits of the school's rectors. The larger reading room contains the bookshelves, the attached smaller one the periodicals. Reading tables for four visitors and shelves are arranged in a harmonic display. Near to the reading room is a work-room for preparing xerox- or other copies. On the 1st January, 1986, the library stock numbered 126,000 volumes, the regularly subscribed periodicals were 640, and the largest national collection of veterinary history was in possession of the library.

The Special Historical Collection of Veterinary Literature, founded in 1984 under the auspices of the Central Library, comprises 5000 volumes of rare ancient books and other documents, which are kept and displayed in a separate room on the first floor. The evaluation and registration of that collection is still in progress, and the best specialists of the National Central Library (Széchenyi Library) have been engaged to restore the invaluable ancient volumes, which are cherished as a national treasure. Most pieces of the collection are protected relics of veterinary and other scientific literature from the fourteenth to the twentieth century; they are made available to scientists for perusal and research at request.

The Historical Collection of Veterinary Relics (the museum) and the archives of the school are housed in the gallery of the aula. Many precious old items of the collection were rescued from decay by mere chance. Old veterinary instruments and other relics reflecting the development of veterinary art from the foundation period to the 'twenties of this century are exhibited in nine cases. Twenty cases display documents of the school's history from 1787, including personal objects of its famous professors. Further 18 cases contain the recently restored sculptures of useful animals and birds, altogether 50 pieces created around the turn of the century by the sculptor György Vastagh *jr.* for purposes of demonstration, on order of the Academic Board.

On instigation and with collaboration of the library staff, random heaps of written documents, found in odd places, have been collected into a well-ordered, valuable *archive* which has revealed many important and hitherto unknown details of the history of the school in particular, and of higher education in Hungary in general. A repertoire of the archives, covering the period 1787–1972, was published by the library some years ago, and other

volumes disclosing the information found in the documents have followed. The archives fill 44 bookcases in 'the museum'.

Services rendered by the Central Library. The librarians surveyed the scope of references required by the units of education and proposed that these be satisfied by data processing. The scientists in need of the references soon came to an agreement, and the computerized information service has been functioning for several years, with the Derwent-VETDOC Abstract Journal, ASCA, FAO/AGRIS, Commonwealth Agricultural Bureaux (CAB) and Food Science and Technology Abstract used as data bases. The library furnishes online access to the data bases. A balanced cooperation has been established between the scientists and librarians of the school in the field of traditional library services (lending, collection of references, information service, copying, inter-library loans, manually prepared reference lists) and new computerized services as well.

The librarians instruct the first-year veterinary students in the use of the library, the third-year students in methods of reference collection, and postgraduate students in the computerized monitoring of the professional literature. The library maintains inter-library exchange and services with similar units abroad, and its staff members conduct independent research on topics of library science.

Current publications of the Central Library

Bibliography of Hungarian Veterinary Literature (eds: Ilona Bakonyi, F. Vetési), annual volume

Current Publications and Papers read at Meetings (eds: Mária Cserey, B. Éliás), annual volume

Publications of the Central Library of the University of Veterinary Science (ed.: Ilona Bakonyi)

Volume 1: Archives of the University of Veterinary Science: Repertory (1741), 1787–1872.

Volume 2: Ancient Books on Veterinary Art in the Library of the University of Veterinary Science.

Volume 3: Extractus protocolli Instituti Veterinarii, 1787–1815.

Register of periodicals.

Department of Chemistry

Chemistry. medical physics

E. Andrási and P. Scheiber

Chemistry

In our 200 year-old veterinary school the teaching of chemistry—beside eight other branches of knowledge—began in 1857, and was taught by Márton Galambos (1820–1872) who was first assistant (later professor). After Galambos's death in 1872 Lajos Thanhoffer (1843–1909), Professor of Physiology had been commissioned to teach natural sciences, including chemistry. In 1879 Leo Liebermann (1852–1926) was appointed full Professor by Á. Trefort, the Minister of Education on the proposal of Károly Than, an authority among Hungarian chemists. At the same time the Department of Chemistry had been established as an autonomous body (1879).

Leo Libermann was an outstanding representative of many sciences, but all details of his major research and organizing work in biochemistry, immunology, public hygiene, food-hygiene, moreover his multilateral activity in scientific publications will not be discussed here, only the period of his career spent in the Institute will be presented. When he was 23 (1875) he became Honorary Lecturer of Medical Chemistry at the Innsbruck University; later at the Budapest University he was granted the degree *venia legendi* from chemistry; furthermore in 1887 he was appointed Honorary Lecturer in judicial and forensic-medical chemistry, too.

Leo Liebermann organized a chemical experimental control station (1881) from which the "National Chemical Institute and Central Chemical Experimental Control Station" had developed. As the Director of this Institute he dealt with problems of general, inorganic and organic chemistry. He was the first, who applied the electric method for the determination of the hydrogen ion concentration. The main field of his work was biochemistry. He published about 100 papers on chemical investigations carried out on the embryo-phase. He made quantitative analyses of hen's eggs, examined the metabolism of embryos, the chemical processes occurring in the stomach mucosa and in the kidney parenchyma. A test reaction was developed by him for determination of proteins (Liebermann-test) which is still in use today.

Beside his research-work, Liebermann also concentrated on teaching; the text of his lectures was summarized in 1890 in manuscript form, and in 1900 a textbook of chemistry was published, entitled "Chemia" written in collaboration with István Bugarszky and followed later by further editions. Furthermore he wrote monographs in German, e.g. "Grundzüge der Chemie

des Menschen" (1880), "Tabellen zur Reduktion der Gasvolumina" (1882), "Die chemische Praxis" (1883), which were edited in Stuttgart.

As a result of his successful activity he was given the title of Royal Councillor; at the Millenary Exhibition (1896) he was the President of the Chemical Society; he was a member of the Public Health Council and of many national and foreign scientific societies, too. His students were among others Béla Bittó, Professor of Chemistry at the Technical University, István Bugarszky and László Rhórer. He aroused Hugó Preisz's and Ferenc Tangl's interest in bacteriology and dietetics, he also helped Ferenc Hutÿra to succeed Á. Azary.

In spite of his successful work Leo Liebermann was only granted the title of a titular extraordinary professor, because Béla Tormay, Director of the Veterinary Academy, underestimated chemistry and ranked it as an ancillary science.

Under such circumstances, after Fodor's death (1901) Liebermann accepted the invitation from the Department of Public Hygiene at the Medical Faculty, and left the Veterinary College and was appointed full Professor, to succeed Professor Fodor.

Following Liebermann, István Bugarszky (1868–1941) who worked for many years together with him, became the teacher of chemistry. He taught in addition to chemistry and experimental chemistry also physical chemistry in the second semester. In the 1906/07 academic year he was Deputy Rector. His textbook was published in a second revised edition in the same year.

In 1911 the reconstruction of the building of Chemistry and Physiology had been completed. New laboratories, offices and a lecture hall seating 144 were built in the two-storey building.

In the 1912/13 academic year István Rusznyák, some decades later President of the Hungarian Academy of Sciences, carried out independent research work in the veterinary school.

Bugarszky moved to the Department of Chemistry at the University of Budapest in 1913 as full Professor, and held this position during a 25-year period until his retirement.

He was the first to achieve important results in experimental determination of free-energy, and to disprove the Thomson—Berthelot theory, for which he became famous both at home and abroad. One of his outstanding discoveries was the determination of the amphoteric nature of proteins.

After I. Bugarszky's was appointed to the Chair of Chemistry in the University of Budapest in 1913, László Rhorer (1874–1937) was temporarily in charge until Gyula Gróh's appointment on 11th December 1913.

Gyula Gróh (1886–1952) was a chemist, Doctor of Philosophy, Professor of Chemistry, Member of the Hungarian Academy of Sciences, and a full Professor of Chemistry in 1917.

In the 1916/17 academic year György Hevesi carried out some research work in the Department headed by Gróh. He was the first to use radioactive isotopes as tracers, and he was awarded the Nobel Prize for this work in 1943.

We have to mention the name of Béla Horváth, who worked in the Department as Bugarszky's assistant from 1904, and gave facultative lectures on "The theoretical basis of analytical chemistry" and on "Chemical investigation of animal products".

World War I created severe difficulties to the College as well as to the teachers, but despite the minor interruptions teaching went on.

In 1919 the Council of Ministers raised the Veterinary College to University standing.

During the 1919/20, 1920/21 and later 1925/26 academic years Gyula Gróh was elected Pro-Rector. During his period at the University he wrote numerous textbooks and laboratory manuals which were popular both at home and abroad. His works were published in German and in Italian, too. His "General Chemistry" was reprinted nine times between 1918 and 1955, "Organic Chemistry" six times between 1925 and 1945 in Hungary.

In 1932 Jenő Kovács Doctor of Veterinary Medicine, the later Professor at the Department of Pharmacology became assistant to Gyula Gróh.

In 1940 Gróh's "Physical Chemistry" was published, filling a long felt gap. His coauthors were Tibor Erdey-Gruz, István Náray-Szabó, and Géza Schay. He published more than one hundred papers, entailing three main areas of research: 1) application of radioactive isotopes in research work; 2) reaction kinetics; 3) investigation of the chemical structure of proteins.

In addition to textbooks he wrote some lecture-notes on physical states, solutions and colloids.

In 1925 he became Corresponding Member of the Hungarian Academy of Sciences and Ordinary Member in 1936. He was a member of the editorial board of "Excerpta Medica", too.

In 1934 all institutions of higher education in agricultural and related sciences were united under the auspices of the Royal József Nádor University of Technical and Economical Sciences. At this time three departments of the Veterinary College were eliminated: Chemistry, Physics and Milk Hygiene.

Professor Gyula Gróh occupied the Chair of General Chemistry of the Faculty of Chemical Engineering at the József Nádor University.

The Faculty for Agricultural and Veterinary Sciences was divided into two Divisions, and both had a Chemical Laboratory headed by Géza Doby and Gyula Gróh, until Gróh's leaving, when his position was taken over by Doby.

Géza Doby (1877–1968) earlier was Professor of Medical Chemistry at the University of Debrecen. Plant-physiology, enzymology and soil-chemistry were the themes of his research work.

In 1935 a new textbook was published, "Inorganic Chemistry, Mineralogy and Technology", for all agricultural colleges, written by Doby and his coauthors, György Eperjessy and István Andrasovszky. Doby gave lectures to veterinary students 4 times weekly and directed laboratory excercises.

In 1944, in consequence of the bombing attacks, the building of the Department was seriously damaged, and the teaching had to be interrupted.

After the liberation of the country in 1945 the teaching already began on 16th April and in 1945 the Faculty of Agricultural and Veterinary Sciences was separated from the József Nádor University.

From 1952 the veterinary school was again raised to the position of an independent College of university standing.

László Urbányi (1902–1974) was appointed to the Chair of the Department of Medical Chemistry. He graduated as chemical engineer, and worked together with József Marek and Oszkár Wellmann in the veterinary school. In this part of his career his interest turned to the pathology of animal rickets.

From 1931 he was assistant, from 1937 Senior Lecturer and from 1941 Reader in the Veterinary Division. From 1935 he was Head of the Biochemical Laboratory in the Department of Animal Husbandry. From 1947 he was the Director of the Department of Chemistry at the Veterinary Faculty. He taught medical chemistry from 1943 and medical physics from 1948.

In 1952 he obtained the degree "Doctor of Agricultural Science". He wrote a new textbook entitled "General Chemistry". His international scientific reputation led to his appointment as Head of the College in 1956. In 1957, after the political consolidation he was dismissed. From 1957 to 1967, until his retirement he was scientific research associate at the Research Institute of Animal Husbandry.

His research work clarified fundamental problems being beneficial to the Hungarian animal husbandry.

After Urbányi László Szekeres (1911) occupied the Chair of Chemistry. He graduated as a chemist in 1932, and received a "Candidate of Science" degree in 1952. He was Deputy Rector of the University of Agricultural Sciences from 1957 to 1960. His area of research was inorganic and organic analytical chemistry.

He wrote two textbooks "General and inorganic Chemistry" and "Organic Chemistry". In addition to these he published numerous other articles.

In February 1968 Szekeres retired (by a ministerial decision), and until October Armand Kemény Professor of Physiology directed the Department.

In October 1968 Károly Nádor (1922) chemical engineer occupied the Chair of Chemistry. He began to work in the Institute of Pharmacology at the University of Medical Sciences, from 1954 to 1968 he headed the Department of Drug-Research of the Institute for Experimental Medicine of the Hungarian Academy of Sciences. As temporary lecturer he taught chemistry of drugs for several years at the Technical University.

Several new drugs (Gastropin, Gastrixon, Mydeton, Spiractin, Yutac) linked with the name of Nádor, and connected with these, more than 130 papers were published. He wrote several monographs on alkaloids having tropane-skeleton or ganglion-blocking effects.

In the 'sixties he gave lectures in many countries of Europe, and spent a long time in Great Britain and in the USA as Guest Professor. He was a member of the Editorial Board of "Index Chemicus", and from 1960 of "Arzneimittelforschung (Drug Research)". He is a member of several international chemical societies and of the New York Academy of Sciences.

In 1952 he received the "Candidate of Science" degree of chemical sciences for his results achieved in tropane-chemistry.

On his own initiation the old laboratories of the Department were remodelled.

He has written some up-to-date lecture-notes, and a textbook "Organic Chemistry" for all agricultural colleges in Hungary.

From 1985 he has given facultative lectures on "Chemistry of biologically active compounds".

Chemistry training occurs in the first semester 3 lectures and 4 hours of laboratory excercises and in the second one 4 lectures and 3 hours of laboratory excercises per week.

Károly Nádor is in close communication with the pharmaceutical industry and within the scope of this cooperation has achieved the total synthesis of oestron and one of prostaglandins.

Károly Nádor is most active with his colleagues in the public life of the University and member of several committees.

Medical physics

In our 200 year-old veterinary school the training of physics began in 1857. Together with chemistry it was taught by Márton Galambos (1820–1872). His successors were Lajos Thanhoffer (1843–1909), Imre Regéczy Nagy (1853–1891), Sándor Korányi (1866–1944), Ferenc Tangl (1866–1917) and Géza Farkas (1872–1934), all professors of physiology.

The reason that the professors of physiology taught physics, was that the symptoms of life were explained with the terms of physics. Helmholtz, who discovered the law of the conservation of energy, was also a physician-physiologist.

Shortly after his appointment and having recognized the great importance of physics, Imre Regéczy Nagy started to write a "Medical Physics", but he could not finish it because of his early death. Sándor Korányi, later one of the famous medical professors, began his studies here to compile the book "Physi-

kalische Chemie und Medizin" written together with Richter and edited in 1907.

Due to professors Thanhoffer, Tangl and especially Liebermann's outstanding work, the Veterinary College was one of the institutions of higher education in Hungary, which founded an independent Department for medical physics. The biophysical research of this period had been done almost entirely in this Department and its further development was greatly promoted by László Rhorer.

László Rhorer (1874–1937), medical doctor, started as assistant in the Department of Chemistry under Professor Liebermann's direction. He qualified as an Honorary Lecturer in physical chemistry in 1902 at the Veterinary College, and in 1907 at the Budapest University. He began regular lectures on physics in 1904, when he was the head of the "Physical Collection". In 1910 L. Rhorer was appointed as full Professor of Physics, and that time the independent Institute of Natural Sciences had been established. Next year he published the textbook "Medical physical chemistry" which was distinguished with the Balassa Prize for its high scientific level. Some years later (1914) his fundamental work "Physics" also appeared. This excellent book served as an important textbook in the training of medical and veterinary students for decades.

László Rhorer carried out his research work in many fields of biophysics, e.g. electrometric determination of acidity of urine, the amphoteric nature of proteins, the osmotic work in the kidney, the acid secretion of the stomach, etc. In cooperation with Pál Hári he elaborated the physico-chemical processes of the curative effects of mineral waters in Hungary.

During World War I, while doing his military service, L. Rhorer directed the radiographical laboratory of the military hospital (and before the war temporarily the Department of Chemistry [1913]), furthermore, he was appointed as Deputy Rector (1916/17).

After the war the central area of his research activity was the study of the biological effect of X-radiation. He carried out pioneering work in this field proving the effect of X-rays on tumours.

In 1923 he moved to Pécs and occupied the Chair of Medical Physics and Radiology at the "Erzsébet" University.

Konstantin Neubauer (? –1945) was chosen as successor, who in addition to teaching physics also dealt with sports. At the beginning of the 'thirties he was elected as President of the Hungarian College Sport-Club, and a member of the National Sport-Council. In 1942 he was appointed Ministerial Counsellor.

From 1934 physics was taught by Béla Pogány (1887–1943), Member of the Hungarian Academy of Sciences, Professor at the Technical University, as a temporary lecturer.

After the liberation (1945), the Department of Medical Physics was headed by Professor Dezső Deseő (1893–1967) till 1947, when it was incorporated into the Department of Medical Chemistry. The lectures of physics were given by László Urbányi (1902–1974) Professor and Head of the Department of Chemistry.

In 1957 László Karádi (1922) as a temporary Lecturer took over the teaching of physics. During his 16-year period, he compiled several lecture-notes, which were always modernized by the actual new developments of physics. His activity greatly promoted the standard of knowledge attained by the students and their approach to natural sciences.

According to a decision of the Rector in 1973, Pál Scheiber (1942) was commissioned to take over the teaching of physics. He has been working at the Department of Chemistry for 1968, and he had a good opportunity for cooperation in the teaching of chemistry in the interdisciplinary fields.

He prepared a new teaching course introducing novel agricultural and medical features and in 1974 he wrote new lecture-notes, revised editions of which were published in 1977 and 1980.

Department of Epizootiology

General and special epizootiology, bacteriology, virology, mycology, immunology

T. Szent-Iványi

In Hungary, teaching the etiology, pathology and control of infectious animal diseases, or epizootiology in short, dates back to the founding of the Department of Veterinary Medicine of the Pest University in 1787, the predecessor of the present University of Veterinary Science. Sándor Tolnay, the first Head of the Department and Institute of Veterinary Medicine in Pest had, from 1787, lectured on the "epidemiology of animal diseases" for one term, for fourth-year students of medicine and second-year students of surgery.

S. Tolnay's exacting knowledge written in Latin, German or Hungarian, had won him esteem in contemporary veterinary science circles abroad, and he was elected a Corresponding Member of the Veterinary Society of Copenhagen.

His successor, József Hoffner, who was elected Member of the Hungarian Scientific Society (the predecessor of the Hungarian Academy of Sciences) taught infectious animal diseases from 1826 not only to medical undergraduates but also to veterinary students who had been admitted initially on very modest entrance requirements.

The training course in veterinary medicine had in due course been extended first to two, then to three years. Hoffner's successor, Vilmos Zlamál, was in charge of the course from 1841 to 1881. He lectured on several subjects, including epizootiology, which had in the meantime evolved to an independent discipline. He also wrote a textbook entitled "Special Pathology and Therapy of Animals" (1877). The contents of this book have disclosed that Zlamál's knowledge of epizootiology was largely based on empirism and failed, therefore, to dispel certain obsolete beliefs concerning the etiology of infectious animal diseases in an epoch which was hallmarked by the discovery of the causal agents of scores of bacterial diseases.

After the retirement of V. Zlamál, the clinic of medicine which had been also responsible for teaching epizootiology, was entrusted to Ákos Azary, a learned doctor of medicine and veterinary medicine. Before taking up his post in 1881, the same year in which L. Pasteur had started his field vaccinations against anthrax, Azary had spent one year abroad on a study tour. He arranged an invitation for Pasteur whose co-worker Thuillier came to Budapest, and performed in the veterinary school of Budapest a successful anthrax vaccination experiment on 55 sheep between the 23rd September and 5th October 1881. Due to Azary's organizational activities, field vaccinations against anthrax, and later also against swine erysipelas, had been introduced in Hungary much earlier than, for example, in Germany, where Robert Koch's initial doubts about the merits of Pasteur-type vaccines had for a long time delayed this approach to specific disease prevention in practice.

After the untimely death of Azary in 1888, the teaching of epizootiology was entrusted to Ferenc Hutÿra, who founded the *independent Department of Epizootiology* in the veterinary school in 1901. Since, however, the *Institute of Bacteriology*, which was simultaneously functioning as another independent Department of the school, was incorporated into the Department of Epizootiology two decades later, a separate description of the history of that Institute and of the contributions of its two directors necessarily interrupts the chronological order of the events related in this chapter.

In the 1890's the discovery of the causal agents of many human and animal diseases by Pasteur, Koch and their coworkers, highlighted the evolving science of bacteriology. In the academic year 1890/91 an Institute of Bacteriology was founded in the veterinary school of Budapest.

The first Director of the Institute, Hugó Preisz (1860–1940), had graduated from the Medical Faculty of the University of Budapest in 1885. He had been sent abroad for a one-year study tour to important institutions including Koch's institute in Berlin, and Pasteur's institute in Paris. Preisz not only comprehended, but creatively extended the knowledge acquired abroad, by independent research. He published a book entitled "Bacteriology" in 1899. The chapters on bacteriology were illustrated by 132 original microphotographs,

uniformly magnified (1 : 1000), of bacteria prepared by ciliary and capsule staining techniques. This work was acclaimed as a pioneering work and won its author an international reputation.

The important contributions of Preisz to both human and animal bacteriology received a new impetus from the facilities offered by the new building (of the present Department of Epizootiology) erected to house his Institute in 1900. He published original papers among others on bovine tuberculosis, the diagnostic value of mallein, pseudotuberculosis, and "enzootic abortion" (brucellosis). He continued the previously commenced production of diphtheria antiserum on a semi-industrial scale, and initiated the preparation of tuberculin and mallein for diagnostic use.

H. Preisz had taught bacteriology in the Veterinary College until 1906, when he was invited to succeed Endre Hőgyes to the Chair of Bacteriology in the Faculty of Medicine of Pázmány Péter University of Sciences (Budapest).

The second Director of the Institute of Bacteriology, Aladár Aujeszky (1869–1933) had also graduated from the Faculty of Medicine in Budapest in 1893. He had first entered a medical practice, then joined the staff of the Department of Bacteriology as co-worker to E. Hőgyes, and, in 1901, the staff of the Institute of Bacteriology of the Veterinary College. In 1903, A. Aujeszky took his second degree in veterinary medicine, and was appointed Honorary Lecturer. During his early directorship, in 1907, the Institute of Bacteriology was entrusted with the control of vaccines produced by private enterprises.

Aujeszky's name is still familiar to posterity from the disease named after him. His original description of the disease and of its differentiating features from rabies dates back to 1902. However, his main research interests were centered on rabies. His book entitled "The Natural History of Bacteria", comprising nearly 1000 pages, was written with the intention to popularize advances in bacteriology, and a similar objective motivated his publishing a series of reports in periodicals. His textbook entitled "General Bacteriology", was published in 1924.

During his 26-year directorship in the Institute of Bacteriology, he maintained interest also in other—occasionally non-veterinary—professional fields; for example, he served for several years as school physician.

After Aujeszky's death in 1933, Rezső Manninger, who had succeeded Ferenc Hutÿra in the Chair of Epizootiology in 1927, was appointed also to the post of Director of the Institute of Bacteriology. Let us, at this point, revert to the year 1888, when Ferenc Hutÿra became Professor of clinical veterinary medicine after the untimely death of Á. Azary.

Ferenc Hutÿra (1860–1934) graduated from the Faculty of Medicine of the Budapest University of Sciences in 1883. As a graduate, he had been on the staff of the Department of Pathology of the Medical Faculty until 1886, when he was invited to work in the veterinary school. On a one-year-long study

tour he visited most veterinary institutions of Western Europe. On his return to Hungary, he gave lectures in pathology for two years (1887–1889). In the meantime, in 1888, he published a book entitled "Etiology of Infectious Diseases of Domestic Animals" which, although a minor volume, represented the first scientifically founded approach to epizootiology in the Hungarian veterinary literature. He was appointed Head of the Department of Clinical Veterinary Medicine, which was then still in charge of teaching epizootiology, too.

His earlier contributions to the professional literature were followed in the period 1894–1898 by his three-volume textbook "Clinical Veterinary Medicine", including infectious diseases. A revised edition of this textbook, compiled in co-authorship with József Marek, was published in German, too, under the title "Spezielle Pathologie und Therapie der Haustiere" (Jena, 1905, first edition). This was followed by a historical series of re-editions of unprecedented international popularity in veterinary literature. The first part of the textbook, dealing with infectious diseases, had originally been compiled by Hutÿra, the second part, dealing with organic diseases, by Marek. The reputed successors of these great scientists, R. Manninger and J. Mócsy, continued the work by adding details of new advances in the respective fields of veterinary science, through a series of re-editions, until the 11th German edition in 1959. Hutÿra himself lived to see six re-editions in German, and several ones in other languages, such as English, Italian, Spanish and Russian. Veterinary scientists generally agree that in the first half of the twentieth century, this volume represented the most widely used veterinary textbook all over the world, in several world languages.

Hutÿra's research interests covered a wide range of infectious diseases, and he regularly added the recently acquired information to the frequent new editions of the textbook. He also published about 60 research reports or reviews in Hungarian, German or French. His treatises on rinderpest, tuberculosis control and glanders were of special scientific importance. In collaboration with J. Köves, Hutÿra substantiated American findings on the virus etiology of swine fever for the first time in Europe, and developed a control of this disease in field conditions. Hutÿra was the first to describe porcine brucellosis in 1909, and contributed fundamentally important reports on immunological problems in co-authorship with Manninger and Marcis. In 1907 the Epizootiological Laboratory, which was re-named as Phylaxia Serum Institute in 1912, had been founded on the instigation of Hutÿra with J. Köves as its first director.

Hutÿra promoted infectious disease control also by various other activities at national and international levels. He undertook the organization of the Eighth World Veterinary Congress, which was held in Budapest in 1905. He represented Hungary at the institution of the Office Internationale des Épizooties (OIE), founded by the representatives of 43 countries in Paris in 1921.

He was appointed President of the OIE Commission in 1928, and of the Permanent Commission for Veterinary Congresses in 1929, and held these honorary posts until his death.

The great merits of Hutÿra in the development of veterinary science won him a reputation both at home and abroad. He was elected Member of the Hungarian Academy of Sciences and of three similar high-ranking scientific bodies abroad, and he was Honorary Doctor *(doctor honoris causa)* of three foreign universities, and Honorary Member of eight foreign veterinary societies. His bronze bust has been erected in the centre of the university campus and a street near to the campus bears his name.

With advancing age Hutÿra gradually transferred the teaching of the subjects in his charge to his self-chosen successor Rezsõ Manninger, who took over the course in epizootiology in 1927, and the course in forensic veterinary medicine on Hutÿra's retirement in 1932.

Rezsõ Manninger (1890–1970) graduated from the Veterinary College of Budapest in 1912, and joined the staff of the Department of Epizootiology in the same year. He took the degree of Doctor of Veterinary Medicine in 1914, and was appointed Honorary Lecturer of Immunology in 1918. As Hutÿra's successor, he served as Head of the Department of Epizootiology from 1927, and as teacher of forensic veterinary medicine as well, from 1933. In the same year, after Aujeszky's death, he was additionally entrusted with the teaching of bacteriology. Thus the Institute of Bacteriology, which had been an independent unit during the professorship of Preisz and Aujeszky (1891–1933) and, after a short period of independence (1927–1933), the Department of Forensic Veterinary Medicine as well, was incorporated into the Department of Epizootiology.

Manninger was a worthy successor of Hutÿra in the fields of teaching, research and science policy as well. In 1928 he organized and presided for 15 years the Central Veterinary Institute. His fluency in German, French and English kept him abreast with advances in the world veterinary literature. He served as the OIE-representative of Hungary for 30 years, and held in the meantime also the post of Deputy President of the OIE for an office period. He ranked among the internationally renowned leading experts of veterinary science, and was appreciated as such in various international veterinary organizations and at veterinary congresses and symposia.

His research interests were centered on the general principles of bacteriology and immunology, and on a wide range of infectious animal diseases. He published more than 200 research papers and reviews in four languages. He investigated the mechanism of certain serological and allergic reactions, the culture properties of salmonella, pasteurella, brucella and *B. anthracis* organisms, including induced mutants of the latter. He made some fundamental observations on virus diseases; in collaboration with Csontos he substantiated

for the first time the etiological role of the same virus for the disease currently termed as equine rhinopneumonitis and equine abortion. His investigations into sheep pox have eventually resulted in the eradication of this disease from the sheep flocks of Hungary. He continued for several decades the swine fever investigations initiated by Hutÿra, until the successful conclusion of a national eradication programme in 1968.

R. Manninger was author or coauthor of several important textbooks. The regular re-editions of these over a period of 35 years furnished up-to-date epizootiological knowledge not only to the Hungarian veterinary undergraduates and graduates but, through Manninger's contributions to the famous textbook originated by Hutÿra and Marek, raised him—as formulated by an English reviewer—to the position of an international teacher of veterinarians on a practically world scale. In co-authorship with J. Mócsy, Manninger compiled the thoroughly revised seventh German edition of Hutÿra and Marek's textbook in 1938, and took charge of all successive re-editions until 1959, when the last—eleventh—edition was published. This book appeared also in five English, three Russian, three Italian, two Spanish, and one each of Serbo-Croatian, Polish and Chinese editions. The triumphal history of this textbook represented the greatest contribution of the Hungarian veterinary school to international veterinary learning. An abbreviated version of this textbook was published in Hungarian for the use of veterinary undergraduates. Even this short version was translated into Slovakian, French and Vietnamese. Another textbook by Manninger, entitled "Veterinary Bacteriology, Immunology and General Epizootiology" was published in three editions.

In addition to his educational and research responsibilities, Manninger was also engaged in science policy. He collaborated in the activities of the Hungarian Academy of Sciences as Member, Department Head and Vice-President of this highest scientific body, which awarded him its Golden Medal of Merit. He was Honorary Member of the World Veterinary Association, of 10 foreign academies and scientific associations, and five universities awarded him the title of Honorary Doctor. The Hungarian government awarded him twice the Kossuth Prize and several high orders of merit.

Rezső Manninger was an outstanding personality of his epoch, and as such he had a decisive influence on the veterinary school and the animal health service of Hungary from the late twenties of this century until his retirement in 1963.

Manninger's successor, János Mészáros (1927) took his diploma in Veterinary Medicine in 1951, and started his professional career in the Department of Epizootiology in the same year. From 1959 to 1967 he served as director of the Veterinary Medical Research Institute (affiliated to the Hungarian Academy of Sciences) and, from 1963 to 1975, also as Head of the Department of Epizootiology. Since 1976 he has again held the director's post in the veteri-

nary research institute. His research work, described in more than 120 publications, covered among others avian mycoplasmosis, Derzsy's gosling parvovirus disease, foot-and-mouth disease, bovine brucellosis, swine dysentery, and bovine and porcine respiratory and enteric disease. He wrote several comprehensive reports on infectious disease control and eradication in intensively managed large cattle and pig herds and poultry flocks. He based his inauguration lecture, held in the Hungarian Academy of Sciences, on problems of disease control under large management systems. He has been editor of, and contributor to, the textbook entitled "Poultry Diseases", which has up to now been published in three editions. He has been coauthor of the manual entitled "Disinfection in Veterinary Practice" and in co-authorship with R. Manninger wrote a textbook on infectious diseases of domestic animals.

J. Mészáros was elected Corresponding Member in 1976 and Ordinary Member of the Hungarian Academy of Sciences in 1982. He has actively participated in several fields of professional social life, acting as Editor-in-Chief of the quarterly, Acta Veterinaria, as President of the Society of Hungarian Microbiologists, as Vice-President of the Department of Agricultural Sciences, Hungarian Academy of Sciences and as President of Joint Commission for Veterinary Science of the Hungarian Academy of Sciences and the Ministry of Agriculture and Food. He was granted the State Award, and he holds an Honorary Membership of the Society of Veterinary Scientists of the GDR.

Tamás Szent-Iványi (1920) graduated from the College of Agricultural Engineering in Kolozsvár in 1942, and took his diploma of Veterinary Medicine in Budapest, in 1946. He joined the staff of the Department of Epizootiology of the veterinary school in 1950, and served as Head of that Department from 1976 to 1985. From 1970 to 1975 he served on the staff of the FAO Headquarters in Rome. His research work contributed to the clarification of the etiology and elaboration of specific preventive measures against certain clostridial diseases, including necrotic piglet enteritis; increasing the specificity of the tuberculin test; the classification of porcine enteroviruses and the differentiation of diseases caused by them, the differential diagnosis of swine fever; the diagnosis and specific prevention of transmissible gastroenteritis (TGE) in Hungary. He collaborated with public health organizations in localizing the natural foci of zoonoses in Hungary, and in developing measures for zoonosis control. He participated in the planning and execution of national disease eradication programmes against tuberculosis, brucellosis, leptospirosis, Aujeszky's disease and enzootic bovine leucosis, and of similar programmes in developing countries. His textbook on "Infectious diseases of domestic animals" written in co-authorship with J. Mészáros, was published in 1985.

T. Szent-Iványi was elected Corresponding Member of the Hungarian Academy of Sciences in 1973, and has been an Ordinary Member of this body since 1979. He is Member of the Leopoldina German Academy of Natural Sci-

ence, and Corresponding Member of the German Veterinary Society (FRG). He retired in 1985. János Varga was appointed to succeed him in the chair of epizootiology.

János Varga (1941) graduated from the Budapest University of Veterinary Science in 1964. He worked for three years on the staff of the Veterinary Medical Research Institute, and joined the Department of Epizootiology in 1967. He obtained his postgraduate "Candidate of Veterinary Science" degree in 1975. His research interests have covered the pathogenesis of swine dysentery, the antigen structure of *E. coli* bacteria, diseases caused by *E. coli* in calves and piglets, the differential diagnosis of avian salmonelloses, and infections caused by *Pasteurella haemolytica* and Campylobacter strains. J. Varga was coauthor of the textbook entitled "Veterinary Microbiology" 1983.

Throughout the about 85-year history of the Department of Epizootiology, its professors and staff have been anxious to keep alive the spirit of the renowned founder Ferenc Hutÿra by keeping the level of teaching abreast with newest developments in the discipline and providing veterinary undergraduates and graduates with up-to-date textbooks. The research work conducted by the graduate staff of the Department has, throughout the course of the Department's history, contributed not only to the appreciation won by the school at home and abroad, but also to the eradication of several important infectious diseases from livestock in Hungary.

Department of Food Hygiene

Meat hygiene, milk hygiene

G. Biró

Meat hygiene

In Hungary, the traditions of meat inspection are much older than the 200-year history of the veterinary school. The twelfth-century documents and regulations of the Hungarian guilds already contain instructions on the licensing of butchers and on meat inspection. Later (in 1787), the responsibility for the innocuity of food items, and even for the healthy condition of the animals intended for slaughter, was transferred to the chief medical officers of the counties *(physici comitati)*. In 1792, Sándor Tolnay, the first veterinary professor of Hungary, on behalf of the Governor-General's Council elaborated a system of regulations which also contained instructions on meat inspection. The Third International Veterinary Congress, held in Zürich, Switzerland, in 1867, discussed the general introduction of meat inspection measures among

its main topics. Vilmos Zlamál, Professor of the contemporary Hungarian veterinary school, who had attended the Congress, advocated the enactment of meat inspection measures in Hungary, and integrated pertinent instructions into his course in epizootiology. The Public Health Act, issued in 1876, prescribed on Zlamál's initiative the examination of all meats intended for sale as a public health measure.

After V. Zlamál's retirement in 1881, Ákos Azary (1850–1888), Doctor of Medicine and a veterinarian, continued lecturing in meat inspection, and the first departmental regulations of the procedures of slaughter of animals and of the retail sale of meat, as well as the first Animal Health Act of Hungary (1888), which also commissioned measures for meat inspection, were issued during his professorship. Azary's successor, Ferenc Hutÿra (1860–1934), the internationally known Hungarian veterinary scientist and teacher, was in charge of lectures in meat inspection until 1906, and developed that subject to an independent discipline of the veterinary curriculum. In 1890 the Act was enacted which prescribed the presence of a veterinary officer (or another authorized person) at the slaughter of cattle, sheep, goats and pigs intended for public consumption, and referred the surveillance of abattoirs and butchers' shops to medical officers. Hutÿra published his "Instructions on the inspection of cattle abbatoirs" (1889) and on the veterinary aspects of the contemporary meat processing techniques (1900) in both Hungarian and German.

Abattoir practicals had been first prescribed for the veterinary undergraduates in 1901. Albert Breuer, who had served as tutor of the abattoir course, was assigned to lecture on meat inspection in the veterinary school from 1906. He served on the Organizing Committee of the Eighth International Veterinary Congress held in Budapest in 1905. Simultaneously, Breuer served as editor of the periodical "Meat Inspection", which was issued regularly as a supplement to the contemporary Hungarian veterinary periodical "Állatorvosi Lapok". Breuer held in the meantime the office of Director of the Public Abattoirs of Budapest, and of all livestock markets of the Capital. The veterinary school promoted him Titular Professor in 1915, and Honorary Doctor in 1924.

After Breuer's retirement, Géza Semsey (1894–1947), veterinary officer in the municipal service of Budapest, was assigned to lecture in meat hygiene. In his person one of Breuer's best pupils, remembered as the founder and first specialist of meat bacteriology in this country, joined the ranks of the teacher of the veterinary school, Semsey had been on the graduate staff of the Municipal Abattoir of Budapest since 1922, and was promoted to Titular Professor of the veterinary school in 1933 for his thesis on bacteriological approaches to meat inspection. In his capacity as lecturer of the discipline, he wrote an excellent textbook on meat inspection (1940), based on the newest regulations to that end (Article XIX, 1928/1932). In 1934 G. Semsey was appointed Deputy Direc-

tor of the municipal abattoirs of Budapest, and from 1941, he served in addition as Head of the school's Milk Hygiene Laboratory Unit, as invited professor.

Milk hygiene

In Hungary, the development of dairy husbandry commenced in the middle of the past century, when the traditional extensive system of cattle keeping was gradually superseded by more intensive farming systems. The Animal Health Act enacted in 1888 prohibited the sale and use of milk yielded by cows suffering from an infectious disease. Another Act in 1895, ordered the examination of milk samples in the National Institute of Chemistry (headed by Leó Liebermann) and in the affiliated regional institutes, to prevent the faking of milk and dairy products. By the end of the past century, courses in milk hygiene were started in most agricultural schools of Hungary; in the veterinary school Leó Liebermann took charge of its teaching, as Professor of Chemistry in addition to his Director's assignment.

Professor Liebermann also pioneered dairy research, and described his observations in several papers, which he usually published in both Hungarian and German. Of his contributions to the early literature of dairy science, mention should be made of a publication on the evaluation of methods for the determination of butterfat content (1885), and of his book on chemical approaches to milk hygiene, which was published twice (for the second time in 1883) by the publishing house Enke in Stuttgart, Germany. One session of the Eighth International Veterinary Congress, held in Budapest in 1905, was already devoted to milk hygiene, and the course in the subject was gradually extended in the veterinary curriculum.

In 1905, the veterinary school's higher authority approved the request of the Rector Hutÿra, and the Academic Board for the establishment of a milk hygiene laboratory unit, and assigned Ottó Fettick to serve as its head.

O. Fettick, a graduate of veterinary and later also of human medicine, started his professional career as coworker to Professor J. Marek in the Clinic of Medicine, and was appointed Titular Professor of milk hygiene in 1908. In that capacity he submitted to the General Assembly of the Hungarian Veterinary Association recommendations for a countrywide control system of dairy production and trade. He was among the organizers and contributors of the Fourth International Congress on Dairy Husbandry, which was held in Budapest in 1909.

Fettick promoted his chosen field also by original research. He published his findings on the microbiological examination of milk samples, role and importance of lactobacilli in dairying, infectious mastitides, etc. both at home and abroad, above all in German periodicals. He pioneered with his staff the first surveys on the etiological factors of mastitis in Hungary.

Fettick was promoted to Titular Professor of the veterinary school in 1924, but his laboratory was not promoted to a department during his professorship. He was succeeded by Géza Semsey, who focussed his interests mainly on the development of microbiological techniques of milk testing.

Subsequently, György Méhes lectured in meat inspection, and Andor Szepeshelyi, Head of the Department and Clinic of Obstetrics, in milk hygiene, until 1949, when Hutÿra's and Liebermann's conceptions of an independent Department of Food Hygiene were at length realised, and Vilmos Csiszár was assigned to serve as head of the newly founded unit.

Vilmos Csiszár (1907–1972) had graduated from the Veterinary College in 1930, and served as teacher of a provincial veterinary academy until 1949. Immediately after his assignment to the veterinary school, he devoted all his efforts to the development of the Department and the discipline. First he wrote textbooks of milk hygiene (1954–1956), which were used by generations of veterinary students, and represented the first comprehensive manuals of the topic in the Hungarian veterinary literature. His manual of meat hygiene, which followed in 1964, summarized all aspects of the course in food hygiene. The further volumes, written by himself and his co-workers on special topics of the discipline, have been widely used as manuals ever since,

The course in food hygiene extended over two terms, with four lectures and one-hour practicals every week in the first term, and three lectures and two-hour practicals a week in the second term.

Professor Csiszár served in 1952–1954 as Director of the Veterinary College.

In 1976, the appointment of János Takács (1921–1978) to the Chair of Food Hygiene was an important event in the life of the department. J. Takács had acquired international reputation as a scientist of food hygiene already during his preceding career. He had been the organizer of the national system of laboratory units in the abattoirs, and had also taken charge of the special training of graduate staff for those laboratories.

The contributions of Hungarian food microbiologists in general, and of J. Takács in particular, to developments in their chosen field were greatly appreciated both in Hungary and abroad. J. Takács held offices in important international organizations: he served as Vice-President of the WAVFH (World Association of Veterinary Food Hygienists) from 1973, as ICMFS-Member of the IAMS (International Association of Microbiological Societies), and as Hungarian Representative on the FAO/WHO Codex Alimentarius Commission. His sudden untimely death was a great loss to the University of Veterinary Science and to the body of Hungarian food hygienists.

Géza Biró (1933) has been in charge of the discipline and department since 1980. After taking his veterinary diploma, he served as Research Associate in the National Institute for Meat Industry Research, and later from 1960

to 1970, in the university Department of Food Hygiene. From 1970 to 1980 he was in charge of coordinating food hygiene work on a national scale, as officer of the Ministry of Agriculture and Food. In that capacity he collaborated in food hygiene legislation. The Faculty of Food Preservation of the University of Horticulture appointed him its Titular Reader in 1973. He has participated in the activities of several professional and social organizations.

The course in food hygiene has been extended to three terms since February 1986. Laboratory practicals have been prescribed for two terms, and are followed by practicals in slaughterhouses and food trade organizations. The course is concluded by a final examination after the 10th term.

Department of Foreign Languages

B. Karvázy

Teaching a foreign language within the framework of the undergraduate training programme was unprecedented in the history of the Budapest veterinary school until 1949, when lessons in initially one foreign language, Russian, were prescribed for two hours a week. Five language teachers were in charge of the lessons and to increase the efficiency of training, the undergraduates attending were assigned to Beginner and Advanced Groups. In 1954, two Latin lessons a week were prescribed for first-year students lacking secondary school education in that language, and optional courses were offered in Western European languages. Also in 1954, the language examinations of veterinary science candidates for a postgraduate degree, were referred to the competence of the Language Department. Since foreign language training or refresher courses for the professional teaching staff have long been promoted by the University authorities, the Language Department also took charge of language examinations for teachers.

In 1955, further to the Russian and Latin courses, a course in an optional Western European language (English, French or German) was prescribed for the undergraduates, and the Department was re-named as Department of Foreign Languages. The teaching staff was increased and the facilities for language training were improved. This promoted the integration of the Foreign Language Department into the organization of the University; the veterinary science lecturers assisted the language teachers in preparing scripts for the undergraduates, which were reciprocated by translations prepared in the Foreign Language Department for training and research purposes, and for the university administration.

A further important advance in the foreign language teaching facilities followed in 1979, with the construction of audiovisual laboratories. From

1982, the compulsory foreign language lessons have been extended to four hours a week, the range of optional language courses has been enlarged, and preparatory courses for state exams in foreign languages have been held at regular intervals. Language courses of all kinds have also been arranged for teacher staff of the University. The number of trainees satisfying the examiners at the state exams has steadily increased since 1980; this and the good performances of the veterinary undergraduates at various competitions in foreign languages indicate that introduction to foreign languages has become an integral part of professional training in the University of Veterinary Science.

Department of General Zoology and Parasitology

General zoology, parasitology, fish pathology, diseases of honey bees and of wildlife

T. Kassai and T. Kobulej

Teaching of *zoology* as an independent subject had been prescribed in the training programme of the Budapest veterinary school for the first time in 1852. Lectures in zoology had been given initially by Alajos Szabó, later for varying periods by Lajos Thanhoffer, Béla Tormay, Károly Monostori and Béla Nádaskay. The contemporary zoological instruction comprised essentially the natural history of domestic animals and the characterization of their most frequent parasites.

At the reorganization of the training scheme in 1890, zoology as such was omitted from the disciplinary programme, and *parasitology* was introduced instead, as an independent subject in the framework of the comprehensive discipline *general pathology*. The curriculum issued in 1899 had already prescribed instruction in the combined discipline *general pathology* and *parasitology*, in the fourth term, in three lessons a week. It should be noted in this context that the Budapest veterinary school was *among the first* of such schools in Europe *to initiate training in parasitology*, in an epoch when that branch of science had just begun to evolve.

In 1892 István Rátz (1860–1917) Head of the Department of Pathological Anatomy, had been entrusted with the teaching of parasitology. Although his professional field had originally been pathological anatomy, pathohistology and microbiology, Rátz took a special interest in parasites and parasitology. He published more than 60 papers, including descriptions of several new species, on protozoa, helminths and arthropods, in Hungarian and foreign (German and French) journals. Through these reports, his name became known to fellow scientists abroad. In 1903, when he was elected Corresponding Member of the

Hungarian Academy of Sciences, he gave his inauguration lecture on protozoa. In 1915, he was appointed Titular Professor of Parasitology in the Medical Faculty of the Budapest University of Sciences. He established a rich parasitological collection in the Department of Pathological Anatomy, but untimely death prevented him from compiling his wide parasitological knowledge into a book.

His great merit lies in the fact that he was the first in Hungary to cultivate and teach veterinary parasitology as an independent discipline for a quarter of a century. The parasitological museum collection established by Professor Rátz, and the adjoining *zoological and parasitological laboratory unit* (two rooms from 1921 and three rooms from 1928) formed the core of the later Department of Parasitology, developed by Sándor Kotlán.

The revised curriculum introduced in 1917 prescribed general zoology (five lessons a week in the first term) and parasitology (two lessons a week in the second term) for the closing examination. For the next two years (1917–1919), outstanding zoologists (Lajos Soós and Sándor Abonyi) had been in charge of teaching both subjects. From 1921 the teaching of zoology, and from 1923 that of parasitology as well, was assigned to Sándor Kotlán, then Senior Lecturer.

Sándor Kotlán (1887–1967), teacher and world-famous scientist of veterinary parasitology, had been on the staff of this school for half a century. His activities were inextricably interwoven with the development of parasitology to an independent applied branch of zoological science. In the very epoch hallmarked by his contributions the originally descriptive, morphological and systematically oriented discipline of parasitology evolved to a complexity of biological, medical and pathological knowledge, which has increasingly assisted the clinical work of medical and veterinary practitioners. He will be remembered by the Hungarian parasitologists as the *founder of modern parasitological science* in this country, but activities other than strictly professional have also kept his memory alive. He wrote a book on the history of veterinary education in Hungary (1941), and collaborated for 22 years (from 1929) on the editorial of the home veterinary journals. In this capacity, he took a major share in elaborating the veterinary terminology of his native language, and in keeping the standards of the home veterinary literature abreast with the international level.

Kotlán had joined the staff of the Department of Pathology already as a pre-graduate in 1910. He was appointed Senior Lecturer and teacher of zoology in 1921, and two years later of parasitology as well. In 1935, he was appointed full Professor. The Hungarian Academy of Sciences elected him Corresponding Member in 1946, and as its Ordinary Member in 1951. He held the post of Dean of the Faculty of Veterinary Medicine of the University of Agricultural Sciences in the office period 1947–1949 and 1951–1952.

With him in charge, the original Parasitology Laboratory of the Department of Pathological Anatomy was promoted to the rank of extraordinary department in 1929, and of ordinary department in 1935.

Sándor Kotlán raised instruction in zoology and parasitology to internationally recognized high standards. From 1931, General Zoology, taught in four and two lectures a week in the first and second terms, respectively, and Parasitology, taught in two lectures a week in the fifth and sixth terms, were prescribed for final examination; practicals (initially optional) were added to the course in parasitology for one hour a week. Integration of parasitology into the training programmes of the fifth and sixth terms enabled a more detailed instruction to be given in parasite pathogenicity. From 1928 to 1944, Tódor Vajda, Titular Professor of parasitological diagnostics and therapy, participated in the parasitological instruction of veterinary undergraduates. Practicals in parasitology have been prescribed since the academic year 1948/49.

In the academic year 1950/51, two lectures and two-hour class practicals a week were integrated into the training programme of the seventh and eighth terms. In the academic year 1958/59, a course in general parasitology (two lectures —held by Tibor Kobulej—and one practical class a week) was held in the sixth term, and was prescribed for end-term examination. The content of that course covered the general morphology, life cycle, and ecology of parasites, phenomena related to host-parasite relationship (susceptibility, immunology, pathogenicity), and introduction to common methods of diagnostic identification, prevention and therapy of parasitic diseases.

Sándor Kotlán was immensely respected by the professional body not only as a scientist, but also for his personal qualities. He was an ardent worker, unassuming and puritanic in the best sense, honest and upright in all conditions, and of a deep-rooted humanitarian outlook, greatly esteemed by all.

His research interests had initially been centered on faunistic and systematic problems. In his first reports written on equine large intestinal nematodes he had already presented much important new information and descriptions of new parasite species. After the untimely death of István Rátz, he took care of the faunistic evaluation of the rich zoological collection brought back by Lajos Bíró from New Guinea. His investigations expanded contemporary knowledge on the parasite fauna of Hungary. Later he increasingly focussed interest on the biological properties of parasites; his pioneer studies promoted the understanding of the life cycles of several coccidia, *Prosthogonimus cuneatus*, *Fasciola hepatica*, *Oesophagostomum dentatum*, *Hyostrongylus rubidus*, *Bunostomum phlebotomum*, etc. Based on studies into parasite pathogenicity, host response and immune response, he recognized the importance of the so-called histotropic phase in swine hyostrongylosis and oesophagostomosis, and discovered the phenomenon of hypobiosis. He elucidated the etiological and vector aspects of babesiosis in Hungary. It would be beyond the scope of this

report to specify all topics investigated by S. Kotlán over half-a-century, for he represented the now extinct type of scientist who had grasped all fields of his chosen discipline and contributed important new information to practically all of them.

His textbook "Parasitology", published in three editions (1944, 1953, 1961), represented one of the best parasitological manuals of his epoch. His other manual, "Helminthology" (1960), written in German, filled a gap in the contemporary parasitological literature; in the introduction to this volume, S. Kotlán advanced his proposal for the uniform nomenclature of parasitoses.

On instigation of S. Kotlán, the *Helminthological Research Laboratory Unit* affiliated to the Department of Parasitology was founded in 1960, Tibor Kassai was entrusted with the organization and management of this unit. Investigations were started into new methods in the control and therapy of helminthoses affecting large herds and flocks, such as lung worm diseases of cattle, sheep and pigs, ovine tapeworms, poultry ascaridiosis, canine tapeworms, bovine cysticercosis, etc. Basic research projects, initiated after 1965, have been concentrated on immune tolerance to parasites and on the mechanism(s) underlying the immune rejection of intestinal nematodes, and have disclosed important new information on these aspects. A method for screening new anthelminthics was also adopted in the Helminthological Research Laboratory.

Although the Department of Parasitology represented a minor unit among the University Departments, in the hands of Professor Kotlán it evolved to the seat of a new school of thought, from which generations of well-trained parasitologists have emerged to key positions. Professor Kotlán always advocated the universality of human, veterinary and zoological parasitology, and his activities had a major influence on the development of the non-veterinary lines of the discipline, too. On his instigation was founded, in 1964, the *Society of Hungarian Parasitologists*, under the auspices of the Hungarian Academy of Sciences; S. Kotlán served as first President, later as Honorary President, of that Society. He did not live long enough to see the first volume of the journal *Parasitologia Hungarica*, issued first in 1968, and his other long-cherished idea, the foundation of an independent parasitological research institute, still remains to be realised.

S. Kotlán was awarded the Kossuth Prize (state prize) in 1951, and on the occasion of the 175th anniversary of the foundation of this University, in 1962, he was awarded the title of Honorary Doctor of the school.

The contributions of S. Kotlán to the development of veterinary parasitology were also appreciated abroad. The Society for Helminthology of Washington elected him its Corresponding Member in 1927. For several subsequent office periods he served as Registrar on the Permanent Commission for Parasitology of the International Zoology Congress. He was Honorary Member of

the Polish Society of Parasitologists (1957), and of the All-Union Helminthological Society (USSR, 1958); in 1962, he was awarded the Theodor Kitt Memorial Medal of the German Veterinary Society (FRG).

He was active as a scientist until his death at the age of 80 in 1967.

After S. Kotlán's retirement in 1966, Tibor Kobulej (1921), Reader in Parasitology, was appointed Head of the Department and was entrusted with the teaching of parasitology, while instruction in general zoology was assigned to László Versényi (1921–1978), Senior Lecturer, from 1966 to 1978.

T. Kobulej had graduated from this school in 1944, and joined the staff of the Department of Parasitology in 1947. He became full Professor in 1968, and served as Head of the Department for 16 years.

Throughout his professional career, T. Kobulej centered his interest on the applied aspects of parasitological research. He combined the practice-oriented activities of Kotlán's school with those of K. I. Skryabin's Soviet helminthological school in pursuing the improvement of parasite control in the intensively managed large herds and flocks. He established close connections with large livestock production units and veterinary practitioners (farm veterinarians), and secured their collaboration in field work. The practice-oriented outlook pervaded his lectures, lecture-notes, and the revised fourth edition of Kotlán's textbook (S. Kotlán, T. Kobulej: Parasitology, 1972) published with his co-authorship.

The research interests of T. Kobulej covered wide scopes of arachnoentomology and helminthology. Apart from morphology and biological properties of parasites, he investigated the epizootiology of various parasitoses and developed measures for their efficient control under intensive management systems. His studies of the epizootiology of liver fluke disease, amidostomosis of geese, canine echinococcosis and bovine hypodermatosis were utilized for the elaboration of complex control measures; these and his observations on the migration of Toxocara-larvae in parathenic hosts have been recognized both home and abroad. He published about 60 original research papers.

Further to strictly professional activities, T. Kobulej has served as technical editor of the quarterly Acta Veterinaria Hungarica (published in English) since its foundation in 1950, and has been on the editorial board of three foreign parasitological journals (Folia Parasitologica, Helminthologia, Angewandte Parasitologie). He served as Secretary and Vice-President of the Society of Hungarian Veterinarians (affiliated to the Hungarian Agricultural Association) for five years (1973–1978), and has been on the Presidential Board of the Society for Hungaro-Soviet Friendship.

The Hungarian Government assigned him several awards in appreciation of his professional and social activities. He served as Vice-President of the World Association for the Advancement of Veterinary Parasitology (WAAVP) in the office period 1977–1981.

The All-Union Helminthological Society (USSR, 1958), the Parasitological Society of the GDR (1978) and the Parasitological Society of the ČSSR (1979) assigned him an Honorary Membership. He holds the K. I. Skryabin Memorial Medal of the All-Union Helminthological Society (USSR, 1983).

Tibor Kassai (1930) succeeded T. Kobulej in the Chair of Parasitology in 1981. He has been on the staff of the Department since his graduation in 1952, apart from a two-year interruption for FAO-advisorship in Iraq (1970–1972).

His research interests had initially been centered on the control of economically important helminthoses under large livestock production systems, and on field trials of new anthelminthics. From 1965, he and his work group conducted basic research on the immunological aspects of parasitoses (immunotolerance; mechanism(s) of the immune rejection of intestinal nematodes, serological diagnostics of bovine cysticercosis), with promising results. These achievements have been appreciated both home and abroad. In 1968, he adapted a method for screening new compounds for anthelminthic efficacy. He wrote more than 100 papers, and compiled the "Handbook of *Nippostrongylus brasiliensis* (Nematode)", published in English in 1982. He contributed a chapter to the manual "Veterinary Pathophysiology" (in Hung.; ed. F. Karsai; 1974, 1983), in which he summarized current knowledge on the immune response of domestic animals.

T. Kassai has served as editor of the journal "Parasitologia Hungarica" from the beginning, as President of the Society of Hungarian Parasitologists since 1972, and has been Member of the Council of the Hungarian Immunological Society. He served as Vice-President (1975–1980), and President (1980–1984) of the European Federation of Parasitologists, and was elected Honorary President of this Federation in 1985. He held the office of Vice-President of the World Parasitologists during 1983–1986, has been Honorary President of the Veterinary Parasitologists' Society of Cuba (1981), and Honorary Member of the Czechoslovak (1978) and Yugoslavian (1979) Societies of Parasitologists.

The teaching of *zoology* in recent years has been entrusted to László Papp (1946), zoologist, Senior Lecturer, outstanding specialist of the field. The undergraduates are introduced to zoology during the first semester, in two lessons a week, and report at an end-term examination. The course in zoology covers, apart from the zoological characterization of animals of veterinary significance, the outlines of ethology and the most important aspects of suprain-dividual organization (population genetics and dynamics, evolution, basic ecology, species populations, ecosystems, etc.).

The course in *parasitology* introduces the undergraduates to the theoretical and practical aspects of the discipline, with special regard to the reduction of losses due to parasitoses in large and small herds and flocks. István Varga (1933) Reader, has been in charge of lectures in protozoology, and T. Kassai of lectures in helminthology and arachnoentomology. Lecture-notes have been

regularly issued to incorporate recent advances in parasitology into the content of the course. The practical room of the Department was reconstructed in 1984. An insectary was established in the Department in 1983, to extend the scopes of insecticide research.

The Department of General Zoology and Parasitology has been in charge of tutoring the prescribed courses in *fish pathology*, *diseases of honey bees* and *diseases of wildlife*.

The course in *fish pathology* was optional from 1954 to 1957, and has been compulsory since 1958, for the ninth term, in two lessons a week; from the academic year 1966/67 on, its organization has been referred to the competence of the Department of Parasitology. Imre Jaczó, fish disease specialist, was invited to lecture in fish pathology from 1954 to 1974. In the period 1978–1982, fish pathology was incorporated into the complex subject "Disease of Fishes, Honey Bees and Wildlife" (two lessons a week on fish diseases, and one lesson each on bee and wildlife diseases in the ninth term). From the academic year 1982/83, the content of the complex subject has been changed to "Fish and Bee Hygiene and Health" and instruction has been transferred to the eighth term and includes two and one hour lectures a week for fish and bee hygiene, respectively. In the framework of this course, lectures in fish pathology have been given since 1974 by József Szakolczai, Titular Reader, fish specialist of the Central Veterinary Institute, as invited lecturer, and lectures in *honey bee husbandry*, prescribed since the academic year 1959/1960 (*"Diseases of Honey Bees"* lately) have been in charge of Attila Örsi (1937), Senior Lecturer, since 1968.

Instruction in *Wildlife Husbandry* has been offered in an optional course since the academic year 1973/74. Undergraduates having attended this course sit for a hunter's examination — which entitles them to use hunter's weapons — before a board of three invited examiners. A course in *diseases of wildlife*, incorporated into the complex course in diseases of fishes, honey bees and wildlife, has been prescribed for closing examination after the ninth term from the academic year 1978/79 on. The prescribed course in diseases of wildlife, and the optional course in wildlife husbandry have been held from the beginning by Miklós Janisch (1922), chief researcher, zoologist.

Department of Marxism-Leninism

S. Zsarnóczai

This Department was founded in 1953; the disciplines covered in its training programme have since been adapted to the actual needs of veterinary education whenever required.

The staff of the Department has been in charge of introducing the students to philosophy, political economy, scientific socialism and the history of the labour movement in Hungary (from the first to the tenth term).

Optional courses are held on the following topics: ethics, rural sociology, political-economical aspects of animal health service, impact of the scientific-technical revolution on agriculture, international economics, agricultural policy, developing countries.

The Department has also taken charge of lectures on economic aspects of food industry and trade, agricultural economics and economic aspects of animal health service, which are included in the curriculum of the postgraduate training courses.

Another responsibility of the Department has been the teaching and examining of veterinary candidates for a postgraduate degree in subjects pertaining to ideological sciences. On behalf of the Hungarian Academy of Sciences postgraduate students are accepted occasionally as well as non-veterinary candidates, to work on their theses in such research topics where an interdisciplinary approach is entailed, since the graduate staff of the Department comprises philosophers, economists and historians, facilitating such cooperation. A monograph on democratic centralism was compiled by the staff on the basis of cooperative research work, and studies into various aspects of the worker-peasant alliance have been conducted for 10 years. Fourth-year veterinary students are regulary invited to collaborate in investigations into certain special economic aspects of animal health service.

Apart from cooperative research, the staff members have also pursued individual research interests. Since the foundation of the Department, eight staff members were awarded the Doctor of Philosophy degree, and four staff members the "Candidate of Science" degree, for original research work.

The first Head of the Department from 1953 to 1969, was Tivadar Pozsonyi (1919), who held diplomas in history, geography, and economics; he was awarded the "Candidate of Historical Sciences" degree in 1967.

His successor, Sándor Zsarnóczai (1928) graduated from livestock production engineering and economics, and holds the "Candidate of Economical Sciences" degree (1982). S. Zsarnóczai has served as teacher in agricultural colleges since 1951. He was appointed Head of the Department of Marxism–Leninism of the University of Veterinary Science in 1970.

Ever since the beginning of his professional career, his research interests have been centered on the laws governing the relations of agricultural production. He investigated the role of collective possessions in cooperative associations, the impact of the socialist transformation of the structure of agriculture on the social macro-structure and the worker-peasant alliance, the system of relations in the social division of labour, with special regard to the impact of the relations of goods production and value categories on reproduction in

agriculture, and the impact of the socialist system of production on veterinary activities. S. Zsarnóczai is author or coauthor of several books, reviews and other scientific papers. Further to his teaching responsibilities, he had held a post in the Central Committee of the Hungarian Socialist Workers' Party from 1960 to 1973, served as editor of the Party's academic periodical (The Social Spectator), and as co-ordinator of two research projects ("Safeguarding interests in cooperatives"; "Economic control of the Party in intermediate and micro-spheres"). He is charter member of the Society of Hungarian Economists, member of the National Committee, and Council of that Society, and President of its Academic Section. He also is Director of the Research Institute of Cooperative Associations. He has been honoured with several ministerial, governmental and party awards in appreciation of his contributions to applied and basic aspects of ideological sciences.

Department and Clinic of Medicine

Internal medicine, clinical diagnostics, pathophysiology

F. Karsai

The Department of Medicine is in charge of training the students in non-infectious animal diseases, methods of physical, instrumental and laboratory diagnostic examinations and therapy. Teaching of pathophysiology has also been the responsibility of the Department. Affiliated to it is the only Clinic of Medicine of the University, which serves the purposes of both teaching and research.

In Hungary, teaching of veterinary medicine dates back to the foundation of the first veterinary school 200 years ago. For a long period, diseases due to bacteria, viruses and parasites had also been taught in the framework of medicine. From the discipline in due course evolved, the study of infectious diseases (epizootiology), parasitology and, much later, the study of animal hygiene, to independent branches of veterinary science.

The first Hungarian scientist of clinical veterinary medicine had been Sándor Tolnay (1748–1818), founder and teacher of the country's first veterinary school. In the very year of the school's foundation (1787) he elaborated a detailed training programme and a precise draft for the placing, staffing and equipment of the animal hospital affiliated to the school. In his written legacy the outlines of clinical veterinary medicine had already taken shape. The school and hospital run by Tolnay had been the predecessor of the present university clinic

Tolnay's successor, József Hoffner (1794–1841) had been a follower of the homoeopathist school. Six years after his appointment as Director of the veterinary school, he had been elected Corresponding Member of the Hungarian Academy of Sciences (1832). Hoffner's deputy, Gábor Doleshall (1813–1891) published several papers on topics of medicine.

From 1843, Vilmos Zlamál (1803–1888) headed the school. He was elected Corresponding Member of the Hungarian Academy of Sciences in 1864, and two foreign veterinary schools (Charkov and Dopart) awarded him the title of Honorary Doctor.

The first written document dealing with lectures in veterinary medicine and their place in the disciplinary programme had originated from Zlamál in an application submitted to a higher authority. As a teacher, Zlamál used sick animals to demonstrate the normal and abnormal functions of the organs, and the etiology, course and therapy of diseases; he gave a series of lectures on the pathology and therapy of "internal and external ailments". The professional posterity sees his main merit in introducing the medical approach in veterinary education, more precisely the classification of diseases by type instead of animal species. Zlamál contributed several publications to contemporary veterinary literature (1853, 1861).

In 1870 lectures in surgery were assigned to Ferenc Varga, while Zlamál continued to teach special pathology and therapy, as well as infectious diseases.

A short, but decisively important epoch of speedy development followed with the succession of Ákos Azary (1850–1888) to Zlamál's chair, whose activities opened up new scope in teaching veterinary medicine on a practical basis and leading research in these fields. He was appointed teacher of veterinary medicine in 1881, and full Professor in 1882. He raised the standards of education in his chosen discipline to the levels of the best veterinary schools in Europe. He had been among the first to initiate the physical examination of animals with all contemporary facilities available. He introduced the use of galvanic electricity for diagnostic and therapeutic purposes, ophthalmoscopic examination and pointed to the importance of uroscopy. He adopted the contemporary bacteriological concepts and as Pasteur's follower, experimented with vaccination against rabies (1884). The "infirmary" for animals developed in his hands to a real clinic; the animals admitted were used not only for the training of the students, but also for research. The students were attracted to assist in both clinical and research work, to improve their scientific outlook.

After Azary's untimely death in 1888, Ferenc Hutÿra (1860–1934) was appointed Head of the Department. He combined teaching of medicine and clinical propaedeutics with demonstration of the methods and instruments of clinical examination in the animal hospital, and introduced the presentation of sick animals to students for revealing and interpreting disease symptoms,

establishment of the diagnosis, and contemplation of the therapeutical approach. He added the chemical and microscopic examination of exudations and excreta to the clinical investigations.

Hutÿra was appointed full Professor at the age of 28 years, impressed his students by his lucid and concise form of his lectures, and did his best to provide them with a comprehensive textbook. After having held the Chair of Medicine for a few years, he published in rapid succession the three volumes of his "Veterinary Medicine" (1894–1898), on a total of 1500 pages. This book goes down in veterinary history as a fundamental comprehensive work of scientifically founded veterinary medicine. Later Hutÿra revised and re-edited the book in co-authorship with József Marek; that version was published first in Hungarian, then in German, altogether in six editions until Hutÿra's death. It was translated into English, Italian, Russian and Spanish, and was used all over Europe as a textbook of veterinary medicine. The General Assembly of the 11th International Veterinary Congress, held in London in 1929, awarded the Budapest Prize (a gold medal) to Hutÿra and Marek for that book, which was valued as the best contribution to contemporary veterinary literature. During his teaching career, Hutÿra increasingly recognized the need for dividing the discipline of veterinary medicine between two departments, and suggested the subdivision of the department in his charge. Since, in later years, he focussed his interest almost exclusively on infectious diseases, he left the Chair of Medicine for that of epizootiology founded in 1901, following the reorganization of the structure of the school. On his instigation József Marek was appointed Head of the also reorganized Department of Medicine, which was thenceforth in charge of the study and teaching of non-infectious diseases and clinical diagnostics, and, for several years to come, of parasitic diseases as well.

József Marek (1868–1952) had, shortly after his graduation, taken over the management of the laboratory of the Veterinary Office at Budapest-Kőbánya. Two years later, in the academic year 1898/99, he was invited to teach in the Department of Medicine of the veterinary school, and was appointed its Head in 1901.

J. Marek started a new epoch in the development of the discipline, by amalgamating diagnostics, therapy, hospital attendance and research into a clinical unit. He introduced the diagnostic use of electric instruments, determined the skeletal muscle sites suitable for electric stimulation, and the physiological ranges of responses to electric stimuli of the muscles and nerves. He made fundamental observations on the neuropathology of dourine. He discovered and described the disease of chickens, which was later named after him (Marek's disease). He investigated and described the neuropathology of neuritis of the cauda equina. Based on acoustic experiments, he presented a new physical interpretation of the origin of respiratory and percussion sounds, and determined the normal lung borders in several domestic animal species. His

studies into the pathogenesis of the so-called thrombo-embolic enteritis of horses were of great importance. His pathophysiological investigations on rickets and osteoporosis, conducted in collaboration with Wellmann and Urbányi (1930–1932), disclosed the causal involvement of metabolic factors. He established an etiologically founded classification for the disease group termed collectively as colic in the horse. The preparation developed by Marek for the therapy of liver fluke disease (Distol) was long used as a highly efficient drug. Marek improved the instrumental diagnosis of unilateral laryngeal paralysis in the horse, and contributed scores of important observations to veterinary medicine.

Six institutions of higher education, such as the veterinary faculties (colleges) of Utrecht, Leipzig, Hannover, Sofia and the Universities of Technology and Agricultural Sciences of Budapest, awarded J. Marek the title of Honorary Doctor. The Hungarian Academy of Sciences elected him Corresponding Member in 1918, and Ordinary Member in 1938. He was honorary member of several scientific societies both home and abroad. After the second World War, he was among the first scientists awarded the highest national prize (golden wreath of the Kossuth Prize). He retired on his own request in 1935, but he continued to participate in professional social and scientific life until his death (1952).

The Council of the capital Budapest named a street in the neighbourhood of the veterinary school after the great scientist and public personality.

One of his first books, entitled "Clinical diagnostics" (in Hungarian), was published in 1902, and was soon (1912) followed by the famous German volume "Lehrbuch der klinischen Diagnostik der inneren Krankheiten der Haustiere". Both volumes were published in several editions, and go down in veterinary history as invaluable contributions to international veterinary literature. Marek's other manual, written in co-authorship with F. Hutÿra, was discussed earlier in this chapter.

Marek elaborated a well-organized system of lectures, practicals and demonstrations, which still forms the basis of operation of the Medical Clinic.

The rooms and facilities of the Department and Clinic were considerably extended and improved during the period of Marek's professorship. He always used slides, pictures and cinematography records as illustration and demonstration material for his lectures.

On Marek's retirement in 1935 János Mócsy succeeded him in the chair on his recommendation. Mócsy's dedicated life and work represented the epitome of that process of development, which had commenced in this school late in the past century with Azary's professorship. J. Marek, and his successor J. Mócsy developed along the lines set out by Azary namely the school of veterinary medicine, which combined research and practical clinical activities for the sake of teaching which was appreciated all over Europe.

János Mócsy (1895–1976) started his professional career in 1918 as coworker to professor Aujeszky in the National Institute of Bacteriology. In 1922, he joined the Department of Medicine of the veterinary school. In 1926 he was awarded a Rockefeller fellowship on which he worked in the Veterinary and Agricultural College of Copenhagen for 10 months, and subsequently in the Veterinary Institute of Hannover. On his return to Hungary he compiled his thesis for the title of Titular Professor, awarded to him in 1929. From 1930 he participated not only in the clinical and research work of the Department, but also gave lectures in medicine and collaborated in the management of the Clinic. He was appointed Lecturer of clinical propaedeutics in 1934, and Head of the Department and Clinic in 1935. He remained in charge of both for 26 years, until his retirement in 1961.

After World War II, he also took part in the management of the school; he served as Dean in the years 1948–1950, and held the post of Director of the school, which in the meantime had gained autonomy, in the office periods 1954–56 and 1957–58.

J. Mócsy's capabilities as teacher and scientist were recognized both at home and abroad. The Hungarian Academy of Sciences elected him as Corresponding Member in 1941, and Ordinary Member in 1945. The Budapest University of Veterinary Science granted him the title of Honorary Doctor in 1962, the Veterinary Faculty of the Humboldt University of Berlin in 1965. He was awarded the Kossuth Prize in 1952, and the first-grade State Prize of the First Order of Merit in 1971. He also held several other high state awards.

The wide scope of J. Mócsy's research interests covered the etiology and pathogenesis of several economically important diseases and the improvement and development of laboratory techniques. He investigated the symptomatology, etiology and pathogenesis of certain parasitoses and several aspects of toxicology. He proposed the use of a dipping solution containing the gamma isomer of HCH for the radical therapy of ovine scabies, and for the first time in Hungary applied a contact poison orally, for the treatment of parasitic dermatoses.

J. Mócsy carried on the intellectual legacy of J. Marek by creative contributions to the development of his chosen field. He was goal and practice-oriented in his scientific activities, and had extraordinary talent for logical thinking and analytical powers as a teacher.

He was among the first veterinary scientists to recognize the importance of animal hygiene. Long before that discipline had taken shape as such, he had emphasized the involvement of environmental factors in the etiology of the multifactorial diseases affecting mainly the intensively managed large-scale herds and flocks. In 1957 the teaching of animal hygiene was introduced on his instigation as an independent subject in the framework of clinical veterinary medicine, with Iván Szép, Reader, assigned as its teacher. Later

Ferenc Kovács, Reader, took charge of teaching animal hygiene, and of the foundation of an independent Department for it in 1962.

J. Mócsy retired in 1961, but maintained contacts with the school and the professional organizations until his death.

With Mócsy's retirement, the orbit of activities of the Department was changed by reorganization. The course in parasitic diseases was entirely referred to the Department of Parasitology, and the course in animal hygiene to the newly founded Department of Animal Hygiene, while the course in clinical diagnostics, which had been, for the preceeding 12 years (1951–1963), in charge of an independent unit (Department of Clinical Diagnostics affiliated to the Outpatient Clinic), was re-adopted.

J. Mócsy's successor, Zoltán Horváth (1927) was appointed Head of the Department and Clinic in 1961, and Professor of it in 1964. He obtained his "Candidate of Veterinary Science" post-graduate degree in 1958, for a thesis written on bovine ketosis.

Z. Horváth adapted the teaching and research activities of the Department to newer demands on the profession. He initiated the system of field courses (between-term external practicals) for small groups of students, and urged improvement of the demonstration materials used for teaching. He wrote a textbook on clinical veterinary medicine and laboratory diagnostics, and contributed parts or chapters to several veterinary manuals published at home and abroad.

The research interests of Z. Horváth covered the metabolic diseases of certain domestic animals, the clinical aspects of infectious and non-infectious canine and feline diseases, bovine leucosis, ECG-examinations on animals, and dermatomycoses of domestic animals. He collaborated in the development of drugs and instruments for therapy of diseases of the bovine forestomachs.

On expiration of the appointment of Z. Horváth, Ferenc Karsai (1928) succeeded him in the chair in 1984. He had served as Reader in Veterinary Pathophysiology since 1966, when that subject was referred to an independent course in the framework of the main discipline. Karsai elaborated the content of the course on the basis of his previous experiences in clinical veterinary medicine, and founded a Pathophysiology Unit under the auspices of the Department. His textbook "Veterinary pathophysiology" published up to now in two editions, has been the first compilatory work of that discipline in the Hungarian language.

F. Karsai's research interests had initially been centered on the pathogenesis and laboratory diagnosis of liver diseases. He was awarded the "Candidate of Veterinary Science" degree on that topic in 1960. Later he contributed to several other fields of clinical veterinary medicine and diagnostics, such as enzyme and liver function tests, and he introduced several simple, reliable procedures for laboratory diagnostic use. More recently he has centered his

interest on the so-called production diseases of cows of high milk yield, with special regard to the diagnosis and control of diseases due to abnormal lipid metabolism.

F. Karsai has cooperated in the planning and management of several research projects in charge of the University, and held the post of Deputy Rector in three consecutive office periods.

He holds the Pavel Adami Memorial Medal of the Veterinary College of Kosice, Czechoslovakia (1970) and the Oskar Röder Memorial Medal of the Animal Husbandry and Veterinary Medicine Division, Karl Marx University of Leipzig, GDR (1983).

Recent increasing demands for specialization in all fields of science have been met by assignment of the Department's staff into one of three largely independent working groups for clinical veterinary medicine and diagnostics in large and small animals, and pathophysiology, respectively.

As to the training programme, class practicals in clinical veterinary medicine are held during terms in the University Medical Clinic and field courses are held between terms for small groups of students in the county animal hospitals. On the eighth term follows a four-week course in farm veterinary practice. The Department maintains connections with the county animal hospitals and several collective farms, state farms and large-scale livestock production enterprises in various parts of the country, to assure mutually advantageous collaboration in teaching and applied research.

The graduate staff of the Department, in addition to teaching responsibilities, has been intensively engaged in research work, mainly on topics pertaining to metabolic and production diseases (management-related diseases) of cattle.

Department and Clinic of Obstetrics and Reproduction Biology

Obstetrics, reproduction biology, udder health

J. Haraszti, G. Rónay, L. Solti and O. Szenci

Two hundred years ago only the students of human medicine and surgery had been trained in the use of obstetric and surgical instruments. However, a radical change followed from the middle of the past century, when mass importation and naturalization of species with more sophisticated environment needs gradually necessitated intensification of the traditional extensive management system. The beginnings of the development of veterinary obstetrics date back to that period. Indirectly the spread of Darwin's doctrines and directly the activities of Vilmos Zlamál (1803–1886), the late famous professor

of this school, led to the coining of a new term for "animal husbandry" in the Hungarian language and to uniting into a new comprehensive discipline the knowledge formerly provided in the framework of natural science, dietetics, morphology, stud-keeping and species characteristics. So it can be understood why the subject "animal breeding", taught from 1856 by Márton Galambos (1820–1872), initially had covered almost exclusively problems of mating and parturition.

In 1873, an independent Department was founded for the teaching of animal husbandry. Professor Béla Tormay, Head of the Department, introduced the veterinary students to obstetrics in two lectures a week, without, however, any demonstration for lack of a clinic and of personal experience in the art of obstetrics. A slight improvement followed in 1882, when Béla Nádaskay (1848–1933), Professor of Anatomy, was entrusted with teaching obstetrics. B. Nádaskay, veterinarian and doctor of medicine, had specialized in veterinary anatomy from the beginning of his career. But his book of obstetrics was the first in this field in Hungary (1887–1889).

The four-year course of training at the veterinary school comprised three lectures a week in obstetrics during the seventh and eight terms, with prescribed practicals in obstetric surgery.

From 1891, Károly Monostori (1852–1917), Professor of Animal Husbandry, took charge of the course in obstetrics. He was, probably, the last polyhistor of veterinary science. His wide scope of professional interests covered various problems of animal husbandry, health and trade, dairy husbandry and hygiene. He had been the pioneer of equine artificial insemination in this country, and the founder of the Hungarian professional literature on animal breeding. He had served as a Teacher of several subjects, which, including obstetrics, evolved in due course to independent disciplines. Although no clinic of obstetrics had been available in Monostori's time either, his textbook "Obstetric surgery" (1898) ranked among the best contributions to contemporary veterinary literature.

After Monostori's retirement, no succession followed for a long time in veterinary obstetrics. In 1899, when the school was promoted to College standing, Béla Plósz, Professor of Surgery, was assigned to lecture in obstetrics. The contemporary curriculum prescribed three lectures a week for one term, and obstetric practicals for three hours a week over two terms. Professor Plósz had already used dummies to demonstrate parturition assistance, and dead calves procured from the abattoir to practise embryotomy. The Hungarian re-edition of De Bruin's book "Bovine Obstetrics" (1911), by Antal Tapken, dates back to that period. Professor Plósz raised castration to the standards of a veterinary intervention, and thereby put an end to laymen's activities in this field. He recognized the importance of infertility and "discovered" the future great personality of veterinary obstetrics, Henrik Hetzel (1875–1949).

H. Hetzel had graduated from this school in 1897. For two years he had been Assistant Professor in the Clinic of Surgery led by B. Plósz, then he was appointed District Veterinarian in Gödöllő (1909) and was entrusted with the responsibilities of Chief Veterinarian in the nearby royal estate. At the same time he also served as tutor of the practical course held at the veterinary school.

In the meantime H. Hetzel went on a study tour to Denmark, where he visited Albrechtsen, reputed expert of the etiology of infertility. From this visit emerged a lasting professional and personal connection. On his return to Hungary, H. Hetzel initiated and led an organized campaign against infertility by the method recommended by Albrechtsen, i.e. by regular screening for fertility of the herds and flocks.

In 1912, H. Hetzel was assigned to give lectures on the pathology and therapy of infertility. In the same year, he published a book entitled "Bovine Infertility", in which he presented a profound analysis of the causes, statistics and possible control measures of infertility in this country. Another manual of H. Hetzel, "Infertility in Domestic Animals", was published in two editions (1926, 1938). In 1918, H. Hetzel, who had in the meantime taken the degree "Doctor of Veterinary Medicine", was appointed Reader in Obstetrics as an independent discipline, in the newly founded Department of Obstetrics; in 1927 he was appointed full Professor.

Hetzel served as Head of the Department of Obstetrics and Director of the affiliated Clinic until his retirement in 1946. He was internationally reputed for his contributions to the development of his chosen field.

He studied the role of faulty management and feeding and dysmetabolism in disorders of reproduction, the therapy and control of metritides, and instigated measures for brucellosis and mastitis control. With his coworker, István Mészáros, he elucidated the etiology of the glandular cystic hyperplasia of the endometrium, the pathogenic role of Trichomonas organisms and investigated certain aspects of neonatology and of postparturient disorders consequent upon dysmetabolism. He was every inch a clinician; he introduced the use of epidural anaesthesia in large animals, and elaborated a surgical procedure for uterotomy in small animals which is still used with slight modification. He studied the position and presentation of the foetus, the specific gravity and composition of the amniotic fluid, the relative mass of foetal envelopes and amniotic fluid compared to the body mass of the dam and the foetus, and the determination of foetal age.

The new Obstetric Clinic of the school was built during Hetzel's directorship. The construction had begun in 1929, and the next year, in 1930 the new clinic was opened, which came up to the highest contemporary standards in respect of structure and facilities, and equally impressed home and foreign visitors.

The pregnant and the sick animals admitted to the Clinic offered abundant opportunity for training of students in bovine pregnancy diagnosis, physical examination of the udder and reproductive organs, and calving assistance. However, Professor Hetzel was not satisfied; he applied to the municipal authorities for admission of the undergraduates to the abattoir once every week, to practise the diagnosis of pregnancy, and of reproductive organs' and udder diseases on cows intended for slaughter.

In the 'thirties, H. Hetzel focussed his research interests on the neurohormonal system, on which he published several papers in both Hungarian and foreign journals. He participated in all kinds of work in his Clinic and personally supervised the practical classes of the students. He held all lectures himself and carefully elucidated all points raised on practical examples. Many theses submitted for the title "Doctor of Veterinary Medicine" were elaborated under his tuition. His manual on obstetrics, published in 1924, ranked among the best written and best illustrated manuals of contemporary professional literature.

Despite the wide scope of his research activities, H. Hetzel never lost the practitioner's outlook. He held field and hospital demonstrations and did not hesitate to introduce the students himself to various veterinary interventions. His small manual entitled "Ovariectomy in Sows" was also a contribution to practical veterinary science. He devised a handy ovariectomy lancet, and, together with Szepeshelyi, an ecreaseur for ovariectomy in mares.

He served as Dean of the Faculty of Agricultural and Veterinary Sciences, József Nádor University of Technology and Economics, in the academic year 1938/1939. He retired after an almost three-decade long, successful teaching career in 1946. Posterity still honours him as the founder of the Department of Obstetrics and the instigator of organized infertility control.

H. Hetzel was succeeded in the chair by his close co-worker and student, Andor Szepeshelyi (1903), for the period 1946–1948. A. Szepeshelyi had initially worked in the Department of Medicine, as J. Marek's coworker, then joined the staff of the Department of Obstetrics in 1931. From 1948 he cooperated in the development of the national artificial insemination system, and retired as Deputy Director of the National Artificial Insemination Centre in due course.

His successor, Kálmán Bölcsházy (1901–1978), served as Head of the Department and Clinic for nearly twenty years. He had joined the Department as assistant to Professor Hetzel a few years after his graduation. He pioneered studies into veterinary endocrinology, and wrote his dissertation for the "Doctor of Veterinary Medicine" degree in 1929 on a related topic ("Early diagnosis of bovine pregnancy by detection of ovarian hormones in the urine").

He was among the first to recognize, after World War II, the interrelationship between management-related factors (concentration of stock, new

management and feeding conditions) and the increasing prevalence of reproduction problems under the altered conditions of livestock husbandry. He soon realized that the homeostasis of the animal organism, including the reproduction potential, was decisively influenced by the harmony of interaction between the animal and its environment. He devised and constructed several instruments which won prizes at home and international exhibitions.

During his teaching career K. Bölcsházy was most active as a professional writer as well. He re-edited and modernized, in co-authorship with István Mészáros, Hetzel's textbook on veterinary obstetrics (1951–1953), and published later with the same co-author a completely revised edition of it (Bölcsházy–Mészáros: Veterinary obstetrics I–II, 1960–1962). Another textbook, written in co-authorship with Sándor Cseh ("Infertility due to non-infectious factors, vasectomy"), was published in two editions (1959, 1963).

K. Bölcsházy's successor Sándor Cseh (1914–1972) joined the Department in 1940, as assistant to Professor Hetzel. He was awarded the title "Doctor of Veterinary Medicine" in 1942, for his dissertation entitled "The diagnostic importance of perturbation in diseases of the bovine oophores". After military service and captivity in World War II, he returned to Hungary in 1948, and was entrusted with organizing the first A. I. Centre for cattle and developing the A. I. technique. In 1951 he was appointed Head of the laboratory in the A. I. Centre, but soon left it for a lecturership in the University Clinic of Obstetrics. He was appointed Reader in 1952, after Bölcsházy's retirement in 1966 Head of the Department.

Sándor Cseh developed the curriculum for undergraduate teaching in reproduction biology. He elaborated the technique of rabbit A. I., and a method for monitoring postpartal involution in the cow. He made important observations on alimentary factors responsible for bovine infertility, and on the basis of investigations into mastitis etiology developed a patent therapeutic against mastitis. He published the results of his investigations into problems of obstetrics, infertility, reproduction biology and udder diseases in many reports, and was awarded the postgraduate degree "Candidate of Veterinary Science" in 1966 for his thesis entitled "Preventive interventions for abbreviation of the bovine service period". His textbook entitled "Obstetric surgery", first published in 1955, and in a revised edition in 1967, is still used.

S. Cseh was co-author of the volume "Infertility of non-infectious origin, vasectomy" (1959, 1963). He did not live to see his comprehensive manual on "Veterinary Obstetrics, Reproduction Biology and Obstetric Surgical Techniques" (1973) published; this posthumous volume was used by the veterinary undergraduates for nearly a decade after the author's death. The last representative of Hetzel's school, S. Cseh did his best to widen the scope of practical training in obstetrics. His busy, active life was terminated by sudden untimely death.

The Obstetric Clinic built in Hetzel's time housed the Department of Obstetrics for almost 40 years. During the long-term reconstruction of the premises at the university campus, the pavilion was demolished in 1968, and the staff was lodged in rooms of the medical and surgical departments for nearly six years. The unfavourable circumstances greatly hampered the normal course of activities until 1973, when the new building could be occupied.

After the sudden death of S. Cseh, György Horváth (1928), Reader, was assigned by the rector to serve as Acting Head of the Department. Gy. Horváth in the meantime promoted to Professor, had been on the staff of the Department since his graduation. He was awarded the postgraduate degree "Candidate of Veterinary Science" in 1962, for his thesis entitled "Interrelationship of the pH and drying conditions of cervical mucus with reproductive function".

In February 1973, János Haraszti (1924), Reader, was appointed Head of the Department by decision of the University Council. He had been on the staff of the Department since 1954. He obtained his "Candidate of Veterinary Science" postgraduate degree in 1962, for his thesis "Therapy of chronic bovine and equine uterine catarrh by curetting". He published many research papers, lecture-notes, textbooks and manuals, and paid visits over shorter or longer periods to several veterinary institutions of Europe.

On his instigation, the research activities of the Department have been focussed mainly on the peripartal metabolic disorders which account for great economic losses in intensive cattle production systems. Studies into the problems of reproduction of pigs under large management systems have been directed at early diagnosis of pregnancy and oestrus control. A method was elaborated for the hormonal synchronization of oestrus in ewes. J. Haraszti initiated investigations into monitoring the bovine sexual function by endocrine hormone tests, based initially on determination of the urinary pregnandiol level, later on plasma progesterone assay. A research team of the Department elaborated a new immune analytical enzyme test, which has since been widely used for serial progesterone assays in serum and milk samples.

Biotechnical research has been conducted in the Department for the last 10 years. Embryo transfer experiments have been performed on rabbits, sheep, sows and cows, with special regard to non-surgical transfer techniques capable of operation at farm level.

The etiology and control of bovine stillbirths and cystic ovaries have been further topics of investigation.

J. Haraszti demonstrated an interrelationship between the faulty management and feeding of cows during the dry period and late reappearance of oestrus after calving, by analysis of the underlying metabolic-endocrine interactions. For a thesis written on this topic, J. Haraszti was awarded the higher postgraduate degree "Doctor of Veterinary Science" in 1985.

Six co-workers of the department, and three foreign scientists who studied in the Department wrote their dissertations from the topics submitted for the degree "Candidate of Veterinary Science".

Undergraduate instruction in obstetrics and reproduction biology has been geared at the clinical outlook. To reinforce the knowledge provided by the lectures, and to improve manual skill, the students regularly attend the clinic, practise surgical techniques and are trained in the obstetric practice in field courses. In the last 10 years about 40 theses submitted for the state exam, and several research papers presented at meetings of the Undergraduate Scientist Club, were compiled under the tuition of the Department's staff. Some of these papers were read at international student conferences.

Lectures on obstetrics, reproduction biology and udder hygiene are held in the third term. Two lectures and two practical classes a week in obstetrics and udder diagnostics are held during the sixth term, three lectures a week on topics of obstetrics, infertility and andrology, combined with group and class practicals in obstetric surgery, follow in the seventh and eighth term.

The staff of the Department has served as lecturers and tutors at several postgraduate training courses and has been in charge of the course for postgraduate specialization in obstetrics and reproduction biology. It can be regarded as a recognition of the high standards of training that a few years ago a group of Egyptian veterinarians were assigned by an inter-state agreement to attend an eight-week course in reproduction biology organized for them in the Department.

The managers of intensive livestock farming units have increasingly recognized that the profitability of production presupposes an undisturbed course of reproduction, and have regularly sought the advice of the Department staff in problems. By advisory activities and other cooperative contacts, the Department has maintained close connections with many farm enterprises to the advantage of both.

Outpatient Clinic

F. Felkai

The Council of 'Pest' ordered by a decree issued in 1842 on "matters pertaining to cases of hydrophobia" that all dogs suspect of rabies must be taken to the Veterinary Institute of Pest for observation. Professor Alajos Szabó took charge of observing the dogs confined to quarantine for suspicion of rabies, and founded an "infirmary" for them, and described his observations in a 95-page volume, which was published in Hungarian in 1850, as well as in German, Slovak, Serbian, Roumanian one year later. In 1851, the Veterinary Institute

became autonomous. From the academic year 1852/53 on, Márton Galambos (1820–1872) gave daily lectures in the dog infirmary on diseases of small animals. In 1865, this course was integrated into the curriculum, and attendance was compulsory for the veterinary students, as can be read in a contemporary application submitted to the school's higher authority. Thus the foundation of a *polyclinic for outpatients* under the auspices of the veterinary school dates back to 1865. Initially the Acting Head of the Clinic of Veterinary Medicine had also served as Head of the Outpatient Clinic. Veterinary service on call was provided from 1896; a team of students led by an Assistant Professor usually of the Department of Medicine, went to see the sick animals at the owner's premises, free of charge.

From 1899 on, teaching in outpatient care was increasingly based on cases brought to the clinic. The outpatient service was, temporarily, in charge of J. Marek (1868–1962), then Assistant Professor and, from 1901 to 1907, of Á. Zimmermann, then Senior Lecturer of the Department of Medicine. A boom of the Outpatient Clinic followed from 1909, when Emil Raitsits (1882–1934), Assistant Professor—from 1925 Titular Professor—of Medicine, was appointed as Head. He led the Outpatient Clinic for almost 25 years, during which he extended its premises and achieved autonomy for the unit. He added a lecture room to the consultation rooms, and developed the unit to a well-equipped polyclinic. He also conducted original research work; his craniometric measurements on dogs disclosed important new information in that field.

Further to his duties in the Outpatient Clinic, Raitsits shared the educational work of the school. From 1919, he lectured in clinical propaedeutics. As a professional writer, he wrote several reports on cynology and cynoiatry. Himself an internationally renowned cynologist, he promoted pedigree dog breeding in the country and started two periodicals on dog breeding, edited the pedigree records of Hungarian dog breeds, and, from 1914 to 1930, the periodical "Nature" (in Hungarian). He initiated the controlled breeding of Hungarian dog breeds (komondor, kuvasz, puli, pumi, Hungarian pointer), and determined their breeding standards. From 1924, Raitsits served as President of the National Dog Breeding Association. Further to cynology and cynoiatry, he took special interest in the diseases of Zoo animals, especially in those of the near-extinct European bison and of canaries. He wrote a book on Hungarian dog breeds, and contributed the chapters on Canidae and the domestic dog to Brehm's "Animal Kingdom".

After the death of E. Raitsits, the Outpatient Clinic was affiliated to the Department of Obstetrics, which was in charge of Henrik Hetzel (1875–1949), from 1936 to 1945. In that capacity Hetzel compiled the second revised edition of a collection of veterinary prescriptions.

From 1948, the Outpatient Clinic was reaffiliated with the Department and Clinic of Medicine, and Ernő Gyarmati (1915), Professor Mócsy's Senior

Lecturer, was appointed its Head. At the same time E. Gyarmati held lectures in "Clinical Diagnostics". He was appointed Titular Professor in the same year. To broaden his own clinical outlook, and to raise the standards of teaching in the subject, he read for the diploma Doctor of Medicine, which he was awarded in 1952. He published many research papers and reports on clinical topics, mainly on nephrology and haematology. Later he focussed on neurology, with special regard to adaptation of human medical diagnostic methods, above all tests of the cerebrospinal fluid, to veterinary clinical use. He was awarded the postgraduate degree "Candidate of Veterinary Science" automatically, in 1952. Patient turnover was considerably increased, and attendance at the outpatients was improved while Gyarmati was in charge of the Outpatient Clinic, which he developed to an independent "Department of Clinical Diagnostics and Outpatient Clinic". He wrote a comprehensive textbook (nearly 400 pages), which was published in the year of his appointment to full Professor of the veterinary school (1954).

Gyarmati's successor, János Csek (1916–1961), Reader, headed the Department of Clinical Diagnostics and Outpatient Clinic from 1957 until his untimely death. His progressive illness did not hinder him from doing his best as lecturer, nor from editing the Hungarian Veterinary Journal "Magyar Állatorvosok Lapja", as another obligation taken over from Gyarmati. His early research interests are portrayed by his publications. He investigated, among others, the diagnostic value of changes in the serum and urine diastase levels of dogs, elaborated an ECG technique for the identification of cardiac disfunction in emphysematous horses, developed new therapeutic approaches to equine serous laminitis and to strangles, and experimented with the therapy of tetanus. His collection of veterinary prescriptions had been used by the practitioners for a long time.

In 1961, teaching in clinical diagnostics was referred to the competence of the Department and Clinic of Medicine, and the responsibilities of the Outpatient Clinic were limited to attendance to the ever increasing number of patients, mostly small animals.

Gábor Benedek (1920), Head of the Outpatient Clinic from 1961 to 1980, had been on the staff of the Department and Clinic of Medicine as Professor Mócsy's co-worker from 1951. He was awarded the "Candidate of Veterinary Science" degree in 1960. His research interests were centered on the diseases of fur animals and the domestic rabbit, above all on myxomatosis; he was Lecturer of the optional course in diseases of the domestic rabbit and for animals.

In 1980 Ferenc Felkai (1938), Senior Lecturer, former co-worker of the Department and Clinic of Surgery and Ophthalmology, was appointed Head of the Outpatient Clinic. He has advanced the development of the polyclinical service ever since he took over. He added an operating theatre to the Outpatient

Clinic for minor surgical interventions, and a dental ward, procured equipment for X-ray examinations, and introduced the ECG-examination of small animals for routine clinical use. Fourth and fifth year students attend two practical classes annually in the Outpatient Clinic, and all undergraduates, including those of the first year, are welcome to participate in the work of the Outpatient Clinic at any time after and between classes.

Three graduate co-workers (two Senior Lecturers and one Associate Professor), three veterinary technicians and a secretary assist the Head of the Outpatient Clinic in everyday health service rendered chiefly to small animals.

Department of Pathological Anatomy

General pathology, pathological anatomy, pathohistology

A. Kardeván

The facilities available in the newly founded veterinary school (Department and Institute of Veterinary Medicine in the University of Pest, 1787) had not favoured a deeper comprehension of the theoretical and practical aspects of general pathology and pathological anatomy, but already the first teacher of the school, Sándor Tolnay, and his successor József Hoffner, had lectured on the contemporary conceptions of general pathology. A report from 1852 discloses that, at the time, the veterinary students had autopsied all carcases available, in the presence of the teacher of clinical medicine and pathological anatomy. The curriculum for the academic year 1859/60 prescribed, for the first time, teaching of pathological anatomy as an independent subject, and referred its teaching to Márton Galambos (1820–1872), veterinarian and graduate medical doctor, who had been in charge of teaching other subjects as well. M. Galambos pioneered original investigations into topics of veterinary pathology (and pharmacology). He published several research reports, and his studies into rinderpest were of particular importance; he experimented with preventive vaccination based on decreasing the virulence of the "contagium" by attenuation in sheep, which led to predictions well in advance of contemporary knowledge. However, the course of teaching veterinary students, which about the middle of the past century had only been going on for two years, necessarily limited the scope of training and research in pathological anatomy.

From 1874 Kálmán Czakó (1843–1895), Doctor of Medicine, was entrusted with teaching pathological anatomy in the veterinary school. After a professional career as human pathologist and study tours to several European university and veterinary schools, K. Czakó was appointed full Professor and assigned to lead the departments of pathological anatomy, pharmacology and

general pathology. His work had initially been hampered by lack of most facilities required for up-dated teaching and research. He nevertheless managed to hold scientifically based lectures on the practical aspects of veterinary art. He initiated the teaching of pathohistology, and also held lectures on botany. A gradual improvement of technical facilities followed after K. Czakó and his staff could move into new premises—a one-storey building erected in 1881. By that time the course of teaching had been extended to three years, and the curriculum prescribed two and three lectures a week in the third and fourth terms, respectively, in general pathology and pathological anatomy, five-hour practicals in post-mortems every week from the third to the sixth term, and also five-hour weekly practicals in pathohistology in the fourth term. Professor Czakó took special interest in problems of forensic veterinary medicine and introduced the students to these in the framework of his lectures on pathological anatomy. From 1888 until his death he headed the Department of Pharmacology, which in the meantime had become autonomous.

For a short period (1887–1889) Ferenc Hutÿra took over lectures on pathological anatomy; in 1888 he published a manual of post-mortem diagnostics, with technical instructions for the sectioning of domestic animals—this was the first textbook published on veterinary pathology in Hungarian.

In 1890 István Rátz (1860–1917), Doctor of Medicine and veterinarian, was appointed Head of the Department. Prior to his assignment he had visited the veterinary schools of Vienna, Munich, Stuttgart, Berlin and Dresden, and several important German medical institutions of pathological anatomy, during a one-year study tour. In addition to general pathology and pathological anatomy, I. Rátz also lectured in parasitology, which had become his favourite subject and the topic of a thesis for which he was awarded the title of Titular Professor by the University of Sciences of Budapest.

In 1900, to the building, which housed the Department of Pathological Anatomy was added a second storey, and the consequent expansion of rooms and facilities furnished for a long time adequate conditions for successful work. The research interests of Professor Rátz covered, further to certain infectious animal diseases, several fields of parasitology; his contributions to the latter have laid down the foundations of veterinary parasitology in this country. His inaugural lecture presented at the Hungarian Academy of Sciences dealt with protozoan parasites of the muscle tissue. He investigated the pathological aspects of porcine anthrax, swine fever, malleus, canine and equine tuberculosis, fowl cholera, fowl pox, avian borelliosis, rabies and Aujeszky's disease. He was also interested in fish pathology: he wrote several papers on fish diseases and founded a laboratory for fish pathology in his Department.

Untimely death prevented Professor Rátz from compiling his carefully accumulated vast knowledge into a book. Only handwritten notes taken down by his students have been left to inform posterity about the contents of his

lectures, but these portray standards of education competitive with those of the best contemporary schools in Europe. During his short but brilliant professional career, Professor Rátz was elected Corresponding Member of the Hungarian Academy of Sciences, and Council Member, corresponding or honorary member of several foreign scientific societies. From 1903 to 1917 he served as editor of the first monthly Hungarian veterinary periodical (Állatorvosi Lapok). He served as Deputy Rector of the school for several years. He was Secretary General of the 8th International Veterinary Congress held in Budapest in 1905, and later on served as secretary of the permanent commission for international veterinary congresses.

For one year after Rátz's death, the Department was in charge of Béla Entz, the later famous specialist in human pathology. In 1918 Károly Jármai (1887–1941), Doctor of Veterinary Medicine, former co-worker of Professor F. Hutÿra, was appointed Professor of Veterinary Pathology. He proved to be a worthy successor of I. Rátz. The Medical Faculty of the Budapest University of Sciences awarded him the title of Titular Professor in Comparative Pathology. He served as Deputy Rector of the school in 1927–1928, and as Dean in 1936–1937.

The research interests of K. Jármai had been initially centered on problems of epizootiology and bacteriology, but in a later stage of his career pathological anatomy and pathohistology became his chosen fields. He geared the investigations of his staff to oncology and he himself was a pioneer in the infectious etiology of avian leucoses. His pertinent experiments were supported for several years by grants from the British "Lady Tata" foundation. He also wrote valuable textbooks. His lectures on special pathology were initially published in lithographic print (1920), later in a book (1936), and finally in a revised and completed edition (1941). His well illustrated textbook of general pathology was published in 1925. During Jármai's professorship, pathological anatomy evolved into a main discipline of veterinary training, as reflected by the considerable number of hours devoted to its teaching during five terms.

K. Jármai was succeeded in the Chair by Gyula Sályi (1903–1982) Doctor of Veterinary Medicine and Titular Professor of the veterinary school. He had started his professional career as co-worker to Professor Jármai. In 1928 he joined the newly founded Central Veterinary Institute, where he was engaged in pathological diagnostic and research work for almost 15 years. To keep his Department abreast with the contemporary European standards, Professor Sályi increased its staff and improved the facilities for education and research. He centered research work on economically important infectious diseases of animals, and contributed much valuable new information to the pathology and post-mortem diagnosis of several virus diseases (swine fever, rabies, pox, foot-and-mouth disease, infectious avian laryngotracheitis, etc.). He was an outstanding teacher, and wrote two excellent textbooks on general and special

pathology. The Hungarian Academy of Sciences elected Gy. Sályi its Corresponding Member in 1962; on this occasion, he presented his inagural lecture on the pathological aspects of pig salmonellosis due to *Salmonella typhi-suis*. His career as teacher and scientist was interrupted by serious illness, which caused him to retire in 1965.

From 1966 Andor Kardeván (1925), Doctor of Veterinary Medicine, "Candidate of Veterinary Science", long-time co-worker of Professor Sályi, succeeded him in the Chair. A. Kardeván served as Vice-Rector from 1975 to 1981, and as Rector from 1981 to 1984.

Increasing the staff and improving the facilities have gone on uninterrupted in the Department also during the last 20 years. In 1971, the first veterinary electron microscope laboratory of Hungary, headed by Professor P. Kapp, was established in the Department; this opened up—though belatedly—new scopes of morphological research and of routine post-mortem diagnostic work as well. The electron microscopic approach has enabled the expansion of investigations into the pathology and pathogenesis of several virus diseases (e.g. infectious canine hepatitis, rhinopneumonitis, duck virus hepatitis, Marek's disease, pigeon herpesvirus disease, duck plague), bacterial diseases (rabbit enteritides, listeriosis), mycoses (aspergillosis) and other conditions (pig oesophago-gastric ulceration, hepatoses, glomerular changes, certain goose diseases, certain bovine metabolic diseases, etc.).

Professor Kardeván wrote a two-volume textbook on the general and special pathological anatomy of domestic animals, and the teachers of the Department have regularly contributed lecture-notes as well as notes of practical training with consideration of advances in the discipline.

The lecture room and the pathohistological laboratory of the Department were reconstructed and equipped with newest technical facilities in 1985.

The staff was increased parallel to expansion of the scope of duties imposed upon the Department: it numbered 8 veterinarians and 11 other employees in 1985.

A. Kardeván retired in 1985; his successor, Ferenc Vetési (1935), had also started his career as co-worker to Professor Sályi. He investigated several fields of veterinary pathology, above all the pathogenesis and the gross and microscopic lesions associated with certain infectious diseases. He described certain infectious diseases of useful animals for the first time in Hungary, and compiled several notes for the undergraduates. He has been serving as Deputy Rector for Education since 1984.

The current training programme for veterinary students valid since 1982/83, contains a somewhat reduced number of lectures and practicals in pathological anatomy (135 hours for lectures and 165 hours for practical training, a total of 300 hours), because teaching of certain subjects (pathophysiology, microbiology, etc.) has been integrated into the framework of other disciplines.

The undergraduates sit for an end-term examination in general pathology after the fifth term, and a final examination in special pathology after the eighth term.

Further to its educational responsibilities, the Department of Pathological Anatomy ever since its foundation has been in charge of post-mortem diagnostic work for the university departments and clinics, and has been Advisory Office for veterinary practitioners, livestock farming units and various institutions. These contacts keep the research activities of the staff practice-minded, promoting further training and the utilization of current practical experiences in educational work.

Department of Pharmacology

Pharmacology, toxicology

J. Kovács and F. Simon

Teaching of veterinary pharmacology in this school dates back to its foundation in 1787. The Latin textbook written by the school's first Professor, Sándor Tolnay (1748–1818), included information on drugs and drug prescription, and presented 74 prescription formulas in accordance with the contemporary Pharmacopoea Austriaca provincialis (1775), which was also valid in Hungary. Although the course in pharmacology was also later on in charge of outstanding veterinary professors (József Hoffner, 1794–1841; Vilmos Zlamál, 1803–1886), the first textbook of pharmacology in Hungarian was published barely a century later, in 1871. Its author Márton Galambos (1820–1872), Professor of General Pathology, Therapy and Pharmacology, subdivided his volume into general and special parts, and based the description of drugs and their prescription on a pharmacodynamic system of classification. Further to the drugs' properties and instructions for their use, he dealt extensively with their pharmacodynamic aspects, and added 306 prescription formulas to the volume.

The integration of general pathology, pathological anatomy and pharmacology into one main discipline outlived its first teacher M. Galambos; after his death, Kálmán Czakó (1843–1895), Professor of Pathology, took over lecturing in pharmacology. Further to topics of pathology, K. Czakó pursued research interests also in the pharmacological field, with special regard to toxicology and poisonous plants.

The second textbook of veterinary pharmacology in the school's history was also contributed by a pathologist, István Rátz (1860–1917) who, as Professor of Pathology and Pharmacology since 1892, translated into Hungarian E. Fröhner's famous comprehensive manual (610 pages) on veterinary pharmac ol-

ogy. That excellent book satisfied the highest scientific requirements and was used by veterinary students for several decades.

In 1896, an independent Department was founded for the teaching of pharmacology in the veterinary school, and Gyula Magyary-Kossa (1865–1944), Doctor of Medicine, was appointed its Head after being junior teacher in the Department of General Pathology and Pharmacology of the Medical Faculty. As a medical pharmacologist, he had turned his interest on antagonism of pharmaceutical preparations, and continued pharmacological research also later, as a veterinary professor. The Budapest University of Science promoted him to Titular Professor of Toxicology in 1894.

In the newly founded Department, which was additionally entrusted with the teaching of botany, Professor Magyary-Kossa took charge of the systematization of the drug and plant collections, and of procuring facilities for research. He raised the courses in pharmacology and botany to internationally recognized high standards. He published papers on original research results on phlorisine diabetes, experimentally induced poultry gout, pathomechanism of arsenic, carbon dioxide and morphine poisonings, calcification due to poisonings, detection of dopes and on application of anti-parasitic drugs. The silver impregnation technique, the so-called Kossa reaction to reveal calcium salt deposition in histological sections is still registered by the international literature.

In 1901 he wrote an excellent textbook on drug prescription, on 379 pages, with 115 figures and 357 prescription formulas, this book was later also published in German. His textbook on veterinary pharmacology unfortunately remained a manuscript for lack of a publisher; it is available in the handwritten notes (1200 pages) of his pupil Dezső Erdős. The first volume of his manual of toxicology also remained a manuscript (in German), but his books "Poisonings" (1898), "Diagnostics of Poisonings" (1894) and "Medicinal plants of Hungary" (with Ferenc Darvas as coauthor) (1926) were published in due course.

The great professional knowledge and extraordinary cultural erudition of Gy. Magyary-Kossa were combined with fluency in five European languages and in Latin, and with rare personal qualities, which were widely appreciated. He was a member of several veterinary and medical scientific and administrative bodies, Corresponding member of the Hungarian Academy of Sciences, and holder of the title of Privy Councillor.

The Department of Pharmacology lost its autonomy in 1934, with the affiliation of the veterinary school to the József Nádor University of Technology and Economics, for that reorganization scheme involved the reduction of the originally 10 veterinary departments to nine. Therefore Professor Magyary-Kossa, doyen of the contemporary veterinary Academic Board, retired distraught with the future prospects of his chosen field at the age of 69, in 1936.

From 1936, Sándor Hasskó (1904–1944), veterinary doctor, Senior Lecturer, was entrusted with the course in pharmacology. He started his profes-

sional career in the Department of Anatomy and Embryology of the veterinary school, where he pioneered investigations into tissue culture techniques, which he continued later in the Biological Research Station of Tihany, and on a fellowship in Berlin. He then joined the National Vaccine Production Institute where he investigated the reticuloendothelial system, and possibilities for new chemotherapeutic approaches; he expanded his knowledge of the latter field on a study tour in Berlin-Dahlem. In 1931, he applied with success for the vacant post of the Pharmacology Department's single junior teacher. To improve his knowledge of pharmacology, he studied and graduated in medicine, and performed chemotherapeutic investigations in Professor Mansfeld's institute in the University of Pécs. For his achievements in the field of chemotherapy, he was promoted to Titular Professor in 1935. In that capacity he extended his research interests to the field of veterinary toxicology as well.

S. Hasskó was among the founders of the International Society for Veterinary Pharmacology and Toxicology, and served on the editorial board of the German veterinary journal "Tierärztliche Rundschau". During his short and contradictory career as Acting Head of the Pharmacology Department, he wrote a comprehensive textbook on veterinary pharmacology and toxicology (344 pages), and published it on his own expenses (1936). That book filled a deplorable gap in the range of the veterinary textbooks; it was revised and re-edited in 1944. S. Hasskó also compiled a collection of prescription formulas for students in 1938.

S. Hasskó left his assignment in the veterinary school in 1939, for a Chair of Physiology and Pharmacology offered him in Ankara, Turkey.

In 1940 Jenő Kovács (1910), Chief Veterinarian, was invited to serve as Acting Lecturer of Pharmacology. J. Kovács had, after his graduation, joined the Department of Chemistry in the capacity of Assistant Professor, and in the meantime obtained his "Doctor of Chemistry" degree. From 1937 to 1940, he was on the staff of the Central Veterinary Institute, in charge of diagnostic work. He was promoted to Titular Professor in 1944, and to full Professor in 1946.

The contribution of J. Kovács to the development of veterinary pharmacology have been widely known both at home and abroad. He published more than 90 research papers, and performed original research work above all in the fields of piglet (iron deficiency) anaemia, therapy of *E. coli*-infection in piglets and calves, and of new veterinary chemotherapeutics.

His outstanding didactic qualities were duly appreciated. In 1952 he was awarded the degree of "Doctor of Veterinary Science". He combined his clear and concise lectures with demonstrations of chemical tests and animal experiments, and distinguished himself by a choice style in verbal and written presentations alike.

Professor J. Kovács attached particular importance to providing the veterinary students and graduates with excellent manuals. His textbook on

"Veterinary Pharmacology" was published in three editions, and his collection of prescription formulas ("Formulae Normales Veterinariae"), edited twice, has been an indispensable reference work for students and practitioners.

Further to his obligations in veterinary training and science, Professor J. Kovács collaborated in the compilation of the sixth Pharmacopoea Hungarica, served as Member of the Editorial Board of the Hungarian veterinary periodical "Magyar Állatorvosok Lapja", as Member of the National Animal Health Board, and as President of the Drug Therapy and Toxicology Section of the Society of Hungarian Veterinarians. In the office period 1963–1966, he held the post of Rector of the University of Veterinary Science.

The Hungarian government bestowed upon him several high awards in appreciation of his contributions to the development of his chosen field. The Veterinary College of Brno, Czechoslovakia, awarded him its Pessina Memorial Medal, the Karl-Marx University of Leipzig, GDR, distinguished him with an Honorary Doctor title in 1980 and the Budapest University of Veterinary Science likewise in 1984.

Professor J. Kovács retired in 1979, and Ferenc Simon (1934), Reader, was appointed Head of the Department. He became full Professor in 1982. After his graduation, F. Simon had joined the Department and Clinic of Surgery, and investigated problems of general anaesthesia and drug administration in animals. In 1963, he joined the Department of Pharmacology and participated in the research projects directed by Professor J. Kovács, above all in investigations into the prevention and therapy of piglet anaemia, veterinary use of anabolic steroids, and zinc metabolism. In 1970–1971, he served as advisor to the Central Animal Health Laboratory of Havana, Cuba, and wrote in Spanish lecture-notes for a course in toxicological diagnostics. His initial clinical interests and his toxicologist experiences abroad motivated him to develop veterinary toxicology to an independent subject. He contributed notes for a course in toxicology in 1974 and in 1981–82.

F. Simon was awarded his "Candidate of Veterinary Science" degree in 1978, for a thesis on porcine zinc metabolism. He and his staff have recently centered research interests on the development of new chemotherapeutic combinations, liver protecting agents, growth promoting feed additives, coccidiostatics, immunostimulants, and on the chemoprophylaxis of swine dysentery and mycoplasmoses, with special regard to applied aspects.

The staff of the Department of Pharmacology has recently been greatly increased to meet current demands on pertinent education and research. New laboratory units (for pharmacokinetic and radioisotope research, for biochemistry, for microbiology and clinical pharmacology) were founded under the auspices of the Department. The international connections of the Department have been extended to cover cooperation projects with foreign sister institutions and drug factories.

F. Simon has served as Deputy Rector of the University of Veterinary Science for successive office periods since 1981. He is a Member of the Council of the European Association of Veterinary Pharmacologists and Toxicologists (EAVPT), serves as the Head of Livestock Production and Health Commission of the National Board of Biotechniques, and has, since 1980, held the office of President of the Drug Therapy and Toxicology Section of the Society of Hungarian Veterinarians.

Department of Physical Education

S. Horváth

This Department has been functioning since 1950. Physical education has been prescribed for one hour a week for first and second years until 1962, since then it has been compulsory for two hours a week. Since 1984 third year students are required to attend physical education classes one hour per week. For students of fourth and fifth years, optional courses have been offered in various sports.

Since 1960, the Department of Physical Education has been in charge of organizing and managing sports teams, and since 1963 it has taken care of mass sporting facilities for the students and the university staff.

The training programme of the Department has been set on improving the skills acquired in sports during secondary school education. Since 1963, special emphasis has been laid on promoting the physical development of the students. Since 1970, the students are also equipped with the knowledge required for organizing and managing sports courses in their future places of employment, at least in a single branch of sports.

In 1984, the Academic Board entrusted the Department with the organization of a prescribed swimming course for students of the third year; since then, no graduate leaves the University without having acquired skills in swimming.

Sporting contests have been promoted since the foundation of the Department. The Sports Club of the University of Veterinary Science (ÁSE) was founded in 1948, and wrestling, basketball and soccer divisions were developed in it until 1950. At present about 40 per cent of the students participate in the women's basketball teams, and in the soccer, tourist, water-sports, tennis, skiing and karate sections. Mass sports contests have been regularly organized on inter-class or inter-university basis for students outside the champion teams.

Initially one sports teacher, with one assistant, was in charge of physical education. In the meantime, the staff of the Department was increased to seven

persons (four sports teachers and three other employees). Under the construction scheme completed in 1976, a gymnasium (30 × 18 m) and a conditioning room was built in the university campus, and was equipped with a wide range of sports facilities. Outside the campus open-air basketball, handball and soccer grounds, and hired places in a swimming pool and a boathouse, promote the physical education of the students.

The racing teams of the University's Sports Club regularly participate in tournaments with home and also foreign student teams.

Department of Physiology

Physiology. biochemistry. radiobiology

H. Boldizsár, F. Kutas and Gy. Pethes

Physiology

The beginnings of the teaching of veterinary physiology are obscure. The first written document referring to the emergence of the discipline is perhaps the report of Gábor Doleschall, medical doctor, on "Physiological Experiments in the Veterinary Institute in Pest", published in 1842.

In 1851, a Department of Anatomy and Physiology was founded in the Veterinary Institute of Pest in charge of Alajos Szabó (1818–1904), then promoted to full Professor. A handwritten script, from 1847, refers to his preceding engagement in the field; his main work, a textbook on the "anatomy of domestic animals, with special regard to physiology" followed in 1877.

Márton Galambos (1820–1872), Lecturer and later Professor of the Veterinary School, discussed many aspects of physiology in the framework of his course on the nature of domestic animals; his lectures comprised the contemporary knowledge on comparative anatomy and physiology.

After the veterinary school moved to new premises in 1872, Lajos Thanhoffer (1843–1909) medical doctor was appointed Head of the newly organized Department of Physiology. Previously he was a coworker of the famous professor Jendrássik for two years (1867–1869), who put him in charge of laboratory exercises on histology. The Medical Faculty promoted Thanhoffer to Titular Professor in 1872.

L. Thanhoffer held the Chair of Anatomy and Physiology of the Veterinary School for 18 years. He equipped his laboratories with the best contemporary facilities for physiological and histological examinations, which were shared by veterinary and medical students, and even by medical researchers.

Although histology remained his main field of interest, he carried out basic investigations on life processes, such as lipid absorption and blood circu-

lation, with special regard to the sphygmographic recording of the arterial pulse. He developed procedures for the recording and analysis of heart, muscle and intestinal contractions. The technique introduced by him for kymographic recording was used during the laboratory exercises until the last decade.

Apart from his many research papers Thanhoffer published a textbook on "Fundamentals of comparative physiology and histology" in Budapest in 1883, and soon afterwards in German translation, also in Stuttgart. In appreciation of his scientific activity the Hungarian Academy of Sciences elected him Corresponding Member in 1890, and Member in 1891.

Imre Regéczy Nagy took over the Chair in 1890 from Thanhoffer. His career was interrupted however, due to his sudden death in the very same year.

In the next academic year, 1891/92, Sándor Korányi (1866–1944), Doctor of Medicine, later one of the most outstanding personalities of medical science in Hungary, was teacher and Deputy Head of the Department of Physiology and Histology.

Ferenc Tangl (1866–1917) was entrusted with lecturing in 1892, and was appointed full Professor in 1893. The scope of his research interests was so wide that the facilities offered by the Department proved unsatisfactory, and a *Research Station for Animal Physiology and Nutrition* was founded on the recommendation of F. Tangl and his co-worker Leó Liebermann.

F. Tangl and his staff initially investigated certain aspects of nutrition and some physico-chemical questions. Above all the molar concentration of the organism was studied. The calorimeter constructed by Tangl for the determination of energy production was used in physiological studies for several decades. Later investigations on nutrition, heat regulation and metabolism won Tangl and his co-workers an international reputation. Demonstration of physiological (and histological) instruments and preparations was a highly successful contribution of the team to the exhibition held during the Millenary celebrations in 1896. F. Tangl was elected Member of the Hungarian Academy of Sciences in 1902; he was promoted to Privy Councillor in 1912.

F. Tangl was succeeded in the Chair by his coworker Géza Farkas (1872–1934), who was appointed Professor in 1908. After his appointment, a storey was added to the building, which provided improved facilities mainly for education.

The research interests of G. Farkas had initially been focussed on the hydrogen ion concentration and carbon dioxide binding capacity of the blood, later increasingly on the physiology of phonation. He founded the Hungarian Society of Phonetics and served as its president.

In 1922, Dezső Deseő (1893–1967), former junior teacher of the Department, took over lecturing in physiology from G. Farkas. He was appointed full Professor in 1927. From 1945 to 1948, he also took charge of introducing the veterinary undergraduates to medical physics. In his laboratories he kept

many candidates for a veterinary doctorate occupied with determinations of the main physiological parameters (composition of blood, urine, etc.) of domestic animals. The development of histology, which had come to a standstill during the professorships of the physiologists Tangl and Farkas, was advanced again by D. Deseő.

The damages of World War II did not spare the Department of Physiology either, but since most valuable instruments could be saved, physiological research was soon recommenced.

Reorganization of the veterinary school in 1948 involved segregation of the disciplines histology, medical physics and physiology, and appointment of Péter Bálint, Doctor of Medicine, to full Professor of Physiology.

Professor Bálint modernized the methods of teaching by introducing laboratory exercises and demonstrations in physiology instead of the former practice of lecture–room demonstrations. During the two years of his functioning as Professor, P. Bálint started up-to-date investigations into the mechanisms of renal clearance, which were studied and reported on by his team at meetings of the Hungarian Society for Physiology from 1949 onward.

Until 1952, Ernő Gyarmati, medical doctor and veterinarian, Titular Professor and Head of the Outpatient Clinic of the veterinary school, was assigned to lecture in physiology.

Armand Kemény (1914–1973), appointed Head of the Department in 1952, was in fact *the first veterinary physiologist with a veterinary education.* He had graduated in veterinary medicine in 1936, and served initially as assistant to K. Jármai, Professor of Pathology; in that capacity he described for the first time in the international literature the infectious sinusitis of geese. He later cooperated in a research group entrusted with the development of antibiotic production in Hungary. After his appointment as Professor of Physiology, he soon recruited an ambitious research staff—mainly of young veterinary scientists—for his Department.

The veterinary outlook represented by A. Kemény to a certain degree changed the contents of the curriculum of the course in physiology. He based the modernization of education in the subject largely on the reorganization of practicals in physiology, and combined his lectures with excellent demonstrations, of which that of Starling's heartlung preparation was probably the most spectacular. He wrote a manual of "Physiology for veterinary students and graduates", which was published in two editions (1966, 1974). He soon recognised that veterinary biochemistry had to become an independent discipline, and wrote his textbook on physiology in that spirit, to be integrated into a volume on veterinary biochemistry, contributed by Zsuzsa N. Gáspár (1965).

A. Kemény focussed his research interests on the physiology of young animals. He described starvation hypoglycaemia in the neonatal pig, and conducted fundamental investigations into acid-base balance, neurohormonal

control of metabolism, amino acid transport, and inorganic ion transport across the blood-brain barrier and the oviduct of the domestic chicken.

He reported his observations not only at veterinary meetings, but also at the conferences of the Hungarian Physiological Society. In appreciation of his achievements the Society appointed him Member of its Board, then of its Council, and assigned him to serve as President of its annual conference held in 1969 in the University of Veterinary Science. A. Kemény was among the first to recognise the importance of radioisotope techniques in physiological research, and extended to his research staff all assistance in his powers to establish the conditions for such work with the support of the National Atomic Energy Commission (see later).

A. Kemény collaborated in the management of the school for four years as Deputy Director and for three years as Deputy Rector.

György Pethes (1926), A. Kemény's successor from 1974, took his veterinary diploma in 1950, but had joined the research staff of the Department already as an undergraduate, in 1946. He was awarded the "Candidate of Veterinary Science" degree in 1960, for his thesis on osmotic and volume regulation. He introduced current techniques of physiological research (clearance, conditioned reflex, isotope tracer techniques, neutron activation analysis, radioimmunoassay) in the Department. He concentrated on studies into endocrine regulation, water turnover, neonatal physiology and effects of certain trace elements. The current experimental work of the research staff of the Department of Physiology covers topics of the endocrine regulation of immunophysiological responses and the physiological role of certain anti-oxidant vitamins and vitamin precusors.

In the last decade, lectures and practicals have been increasingly centered on the physiology of farm animals.

Professor Gy. Pethes has served as (one) Vice-President of the Hungarian Physiological Society, and as President of the IUPS/WVA Commission on the Physiology of Domestic Animals.

Biochemistry

The beginnings of biochemical research date back in this school to the end of the past century with the foundation of an independent Department of Chemistry (1879). The Head of the contemporary Department of Chemistry, Leó Liebermann (1852–1926) had a comprehensive knowledge of natural sciences. With his co-worker, and later successor, István Bugarszky, he demonstrated already in 1896, at the Millenary Exhibition, instruments used for analysis of biological fluids (blood, urine, etc.). The studies of Bugarszky and Liebermann into the acid-base character and the acid binding capacity of

proteins are already of a biochemical orientation. Liebermann's co-worker, László Rhorer (1874–1937) contributed fundamental observations on the electrometric determination of urine pH, renal osmotic functions and the role of the protein components of the gastric juice.

In the same period Ferenc Tangl established an experimental station under the auspices of the veterinary school, for nutrition-biochemical research (1896).

Tangl's co-worker, Oszkár Wellmann, later Professor of Animal Husbandry, relied on biochemical techniques in his investigations into energy and electrolyte metabolism. In 1912 he started, in cooperation with Professor J. Marek, studies into the pathological alterations of certain biochemical parameters in connection with rickets; the results of these were described in Part II (Biochemical Aspects) of the book written by the two scientists on rickets (1932). László Urbányi, Chemical Engineer and later Professor of Chemistry, who had collaborated in rickets research, continued work along this line; his observations on the Ca- and P-metabolism and supply of domestic animals, and his recommendations elaborated to that effect served for decades as reference values in nutrition science.

Progress in biochemical research was considerably promoted by addition of well-equipped laboratories to the Department during the professorship of Géza Farkas; in that period, studies on the H^+-concentration and CO_2 binding capacity of the blood led to original discoveries.

G. Farkas's successor, Professor Dezső Deseő, was a follower of the traditional school of physiology, but several theses, prepared by candidates for a veterinary doctorate under his tutoring, were based on biochemical methods.

In the early 'fifties, biochemical research was recommenced in the Department by the Senior Lecturer Balázs Juhász, who also advocated undergraduate teaching in biochemistry as an independent subject. Some lectures on biochemical topics were integrated into the course in physiology in 1950/51, and from the next academic year (1951/52), biochemistry was added to the range of prescribed subjects. B. Juhász compiled lecture-notes, and in 1953 (with a co-author) a textbook of biochemistry for the undergraduates. He resumed his connections with the Department more than two decades later, in the capacity of Titular Professor and as a "Doctor of Veterinary Science". His studies into the digestive functions and metabolism (above all the N-metabolism) of the forestomach of ruminants are of fundamental importance.

As already noted, Professor A. Kemény had promoted the progress of veterinary biochemistry from the beginning of his professorship. In 1953, he founded a biochemistry unit in the Department of Physiology, and entrusted Zsuzsa N. Gáspár with lecturing in the subject. This led to the integration of

biochemistry into the veterinary curriculum, and to its promotion to an established discipline. In 1962, introduction to biochemistry was extended over two terms (the third and fourth), and in 1963 it was prescribed for final examination. Zs. N. Gáspár wrote a textbook (1965) on veterinary biochemistry for the students, which was used by them for many years after her untimely death.

In the 'sixties and early 'seventies, the research staff of the Department was engaged in investigations into the physiology of young animals.

That project, directed by Professor A. Kemény, also covered biochemical aspects, such as carbohydrate metabolism (Zs. N. Gáspár), serum protein turnover (B. L. Tóth) and P-metabolism (F. Kutas and M. Stützel).

After Zs. N. Gáspár's death, Béla L. Tóth, Reader, was assigned with teaching biochemistry from 1965 to 1973. He was succeeded by F. Kutas, Senior Lecturer, who is still in charge of the discipline, recently as Professor. The course in biochemistry has currently extended over the third and fourth terms and covers 90 hours lectures and 52 hours practicals. A final examination in biochemistry has been prescribed after the conclusion of the fourth term.

During almost four decades of the independent disciplinary development of veterinary biochemistry, the lecturers in charge have continuously adapted the contents of the biochemistry course to advances in this dynamically developing branch of science.

Radiobiology

Radioisotope techniques have been used in Hungary in general, and in the Department of Physiology in particular, since 1955. Professor Gy. Pethes organized a level C radioisotope unit in 1958, and raised it to level B in 1960–1964. An optional course on the main applications of radioisotope techniques in veterinary medicine has been offered to the students since 1960.

Initially acute model experiments, since 1974 studies based on radioligand techniques (e.g. RIA) have been performed in the radioisotope unit.

Department of State Veterinary Medicine

State veterinary medicine, forensic veterinary medicine, veterinary economics, computer technique in the animal health service

Gy. Lami

The Department of State Veterinary Medicine was founded in 1946, and its staff gradually took charge of the teaching of four disciplines.

State veterinary medicine

At the beginning of veterinary education in Hungary (1787), veterinary administration had been under medical control as part of the public health administration. The orders and instructions concerning the control of infectious diseases and other animal health measures were issued by the country's chief medical officer (protomedicus), and were executed by the medical administration of the counties and towns. The students of Hungary's first veterinary professor, Sándor Tolnay, had therefore been introduced to the contemporary measures of veterinary policy by attending, from 1793, the course held for the medical undergraduates in public health administration. However, veterinary participation in animal health control had increasingly gained ground with the functioning of the veterinary school. Professor S. Tolnay was invited to serve as veterinary advisor to the Royal Governor-General's Office, and in that capacity worked out instructions for the prevention and control of rinderpest. With the establishment of the National Veterinary Office in 1838, and appointment of the veterinary professor Vilmos Zlamál (1803–1886) to Chief Veterinary Officer of Hungary, the animal health administration was partly referred to veterinary competence, but the graduates of the veterinary school still had no administrative authority. Veterinary policy was eventually segregated from the public health administration in 1867, and was referred to the authority of an Animal Health Department founded in the contemporary Ministry of Agriculture, Industry and Trade. The teaching of state veterinary medicine had then been in charge of Vilmos Zlamál, Professor of Epizootiology, who included in his textbook, published in 1877, the full text of Hungary's first Animal Health Law, issued in 1874. Another pertinent decree, enacted in 1888, regulated the system of the national animal health administration, the assignment of veterinary officers to different administrative levels, and prescribed as a prerequisite of admission to state service an "officer's examination" in state veterinary medicine. Undergraduate training in that discipline was adapted to the higher demands. From 1880 until the foundation of a separate department in 1946, the Chief Veterinary Officers were entrusted

with its teaching. Róbert Dubravszky (1858–1922) who had served as its Lecturer from 1890 to 1912, had been the initiator of veterinary literature in that field in Hungary. His successor, László Fokányi (1874–1940), lectured in veterinary administration until 1933; he had been the first veterinarian to hold a leading government office. He was the originator , with his coworker, V. Horváth of the Animal Health Act of 1928, and of the ministerial order (100 000/1932) requiring its execution. This Act had been in effect for several decades, and provided a solid basis in the conduct of veterinary services and in the eradication of several contagious diseases (rabies, glanders, dourine, etc.), and a reduction in the prevalence of others. Fokányi's successor in his ministerial office, Vilmos Horváth (1879–1949) lectured in state veterinary medicine from 1933 to 1939 adapting the contents of the course to contemporary standards.

In 1939, Jenő Schwanner (1888–1964) took charge of the course in veterinary administration, and was its invited Lecturer until 1946, when he was appointed Professor and Head of the newly founded Department of State and Forensic Veterinary Medicine of the veterinary school, and was additionally entrusted with the course in forensic veterinary medicine (see later). Thus two disciplines overlapping the legal aspects of veterinary administration were referred to the competence of the new Department. J. Schwanner had taken his diploma in veterinary medicine in 1911, and was on the staff of the Department of Pathology until 1919, when he entered the state service. He served as leading veterinary officer at district and county level until his invitation to the Animal Health Department of the Ministry of Agriculture in 1935. As a ministerial officer, he elaborated effective measures for reducing the prevalence of certain infectious animal diseases, surveyed the economic losses arising from brucellosis and infertility, and organized the control programme leading practically to the eradication of rabies from Hungary at that time. He developed a wide range of statutory provisions for animal health control (1938–1952), and cooperated in the elaboration of such provisions also later, during his professorship. He served as President of the *Forensic Veterinary Medical Supervisory Commission* recruited from members of the veterinary Academic Board. He obtained his degree "Candidate of Veterinary Science" in 1952. Professor J. Schwanner retired in 1963.

The name of the Department was changed to" *Department of State Veterinary Medicine*" during Schwanner's professorship. The number of lectures in state and forensic veterinary medicine were not changed for nearly 20 years following the foundation of the Department.

In 1963, László Várnagy (1920) was assigned to serve as Head of the Department in the capacity of Reader in State Veterinary Medicine, after a nearly 20-year preceding career in state service at district and ministerial level. As a ministerial officer, L. Várnagy codified the system of the Animal Health

Regulations issued in 1962, and contributed several articles to it. With his assignment to the Chair, he also became President of the Forensic Veterinary Medicinal Supervisory Commission. He obtained his "Candidate of Veterinary Science" degree in 1965, and was promoted to full Professor in 1966. He served from 1966 to 1978 as Deputy Rector, from 1978 to 1981 as Rector of the University.

L. Várnagy focussed his scientific interests on the economic aspects of the animal health service, on forensic veterinary medicine in general, and on certain fields of veterinary history in particular. In his thesis submitted for the "Candidate of Veterinary Science" degree, he laid down fundamental statements on the new scopes of veterinary administration evolving with the Socialist transformation of the structure of agriculture, and initiated new approaches to the implementation of animal health measures under the changed conditions.

The activities of L. Várnagy in Hungarian and international professional organizations deserve special mention. He served as Secretary (1953–1968), President (1968–1978) and Honorary President (1978–1981) of the Society of Hungarian Veterinarians, and has held the office of President again since 1981. He served on the Editorial Board of the Hungarian Veterinary Journal "Magyar Állatorvosok Lapja" for 25 years (1961–1986), and represented Hungary in the Permanent Commission of the World Veterinary Association (WVA) for 11 years (1971–1982).

During L. Várnagy's professorship, the course in state veterinary medicine was extended (to 60 hours from 1974, and to 71 hours from 1978 onward), and its contents were reorganized to integrate introduction to the organizational aspects of veterinary management in the large livestock production systems, which increasingly tended to prevail under the Socialist system of agriculture. In 1974, the discipline was re-named as *state veterinary medicine and organization* and its teaching was extended over two terms (the eight and ninth).

After L. Várnagy's retirement in 1982, László Visnyei, Senior Lecturer, was entrusted with the course in state veterinary medicine and administration, and with part of the lectures held in the framework of the course in the economic aspects of the animal health service, whereas the teaching of forensic veterinary medicine (see later) was assigned to Professor Gyula Lami.

L. Visnyei (1946) graduated (Doctor of Veterinary Medicine) in 1970, and completed a course for postgraduate specialization in veterinary administration and organization in 1977. He joined the Department in the same year. Further to his teaching responsibilities, he has pursued scientific interests in veterinary administration and economics.

The course in the *economic aspects of the animal health service* (see later) was added to the veterinary curriculum in 1982, as an integral part of the main discipline veterinary administration and organization, and has since been

extended to two terms (the ninth and tenth), with a total of 75 lecture hours.

State veterinary medicine had been prescribed for closing examinations from 1890 to 1952, and has been one subject of the state examination since 1952.

Practicals have been added to the course in state veterinary medicine since 1922. Up to 1951, the veterinary students were obliged to work, during part of their two-month field course, under the supervision of a district or municipal veterinary officer. Since 1951, the practical course has been held on a predetermined schedule which covers attendance at different levels of veterinary administration.

Since the introduction of courses for *postgraduate specialization* (from 1971/72), lectures in state veterinary medicine have been added to the training programme of most fields of postgraduate veterinary specialization.

Forensic veterinary medicine

Contemporary documents disclose that "veterinaria forensis" had already ranged among the subjects covered by the veterinary course *(cursus hippiatriae)* as early as in 1819. In 1863, reporting in *forensic veterinary medicine* was prescribed for the first closing examination, and Professor Alajos Szabó took charge of its teaching, which was later referred to a course entitled "Warranty in livestock trade" (1868). By that time the junior teacher Sándor Eisenmayer served as Lecturer of the course, and he also wrote a book on "Forensic veterinary medicine" in 1866. Subsequently, introduction to the subject was for a long time the responsibility of a junior teacher.

A remarkable development of the discipline commenced in 1899, when Professor Ferenc Hutÿra took over its teaching. He remained in charge of it until his retirement in 1933, headed the Department of Forensic Veterinary Medicine during its temporary independence from 1927 to 1933, and served a President of the veterinary school's Forensic Veterinary Medical Supervisory Commission from 1918 to 1933.

Hutÿra was the originator of the regulations controlling warranty suits in livestock trade. He collaborated in drafting the Livestock Trade Warranty Act and elaborated the regulations controlling the presumption of redhibitory defects in animals. The act and the regulations outlasted their brilliant originator, for they were in force until 1960, when the speedy development of large livestock production units under the evolving Socialist system of agriculture necessitated their revision. Hutÿra also contributed a new textbook of forensic veterinary medicine, which was published in two editions (1908, 1925).

After Hutÿra's retirement in 1933, Rezsõ Manninger, his successor in the Chair of Epizootiology, took over the teaching of forensic veterinary medicine

and the duties of the President of the Forensic Veterinary Medical Supervisory Commission until the foundation of the independent Department of State and Forensic Veterinary Medicine in 1946.

Subsequently, the Heads of the Department, Professors J. Schwanner and L. Várnagy were in charge of the course in forensic veterinary medicine, and were also entrusted with the revision of the legal prescriptions referred to above. The fundamental modifications were elaborated by Professor Schwanner, and his successor, L. Várnagy, took over the adaptation of the warranty rules to the changed situations presented by mass incidence of infectious diseases under large management systems. Independently or in collaboration with prominent co-authors, L. Várnagy gradually elucidated all legal problems arising in connection with various infectious poultry diseases, carp viraemia, porcine *E. coli*-infections and oedema disease, bovine tuberculosis and brucellosis, porcine leptospirosis, etc. In several publications, he also laid down instructions on warranty and indemnity problems related to mass livestock trade. He summarized his life-work in the legal field in his textbook on forensic veterinary medicine, published in 1979.

Under the current curriculum, the course in forensic veterinary medicine covers one lecture a week in the ninth term and three lectures a week in the 10th term (on a total 45 lectures), and is prescribed for final examination after conclusion of the tenth term.

Professor Gyula Lami (1922) was appointed Head of the Department in 1982, and has since been in charge of the course in forensic veterinary medicine, and of the presidency of the Forensic Veterinary Medical Supervisory Commission. He graduated from the veterinary school in 1946, and was awarded his "Candidate of Veterinary Science" degree in 1963. He has been on the staff of the veterinary school uninterruptedly since 1945. His initial specialization in clinical veterinary medicine has determined his outlook in the forensic field, in which he had become interested already during his preceding clinical career. He cooperated in examining the students in forensic veterinary medicine during J. Schwanner's professorship, and shared lecturing and examination duties in the subject during L. Várnagy's professorship. His contributions to forensic veterinary medicine have covered problems of judging the positivity of intradermal tuberculin tests, the relativity of relevance in legal matters, and several general aspects of the field. Gy. Lami served as Deputy Director of the Veterinary College in the office period 1957–1961, and has been in charge of the home and international relations of the University since 1984, in the capacity of Deputy Rector.

Much reference has already been made in this chapter to the University's *Forensic Veterinary Medical Supervisory Commission*, which has assisted jurisdiction in suits of veterinary relevance uninterruptedly since the early years of this century. For several decades the Academic Board issued expert testi-

monies in legal matters, but since the school has been promoted to University standing, the Supervisory Council, whose members were appointed by the Rector, has given expert opinions in legal matters. Since 1976, the Forensic Veterinary Medical Supervisory Commission has re-examined and evaluated veterinary testimonies given in civil or criminal procedures at the request of a court of justice or other organization in charge of investigation, and has issued a written testimony in detail. A further responsibility of the Commission has been the control of the integration of the terms of forensic veterinary activities. At present both office-holders (president and secretary) and all 10 members of the Commission have been recruited from teachers of the University.

In recent years, the legal procedures handled by the Commission have numbered 15 to 20 per annum.

Economic aspects of the animal health service

A modification of the veterinary curriculum in 1978 has involved addition of that new subject to the disciplinary programme of the Department of Veterinary Administration and Organization. The course in the economic aspects of the animal health service has since covered 20 lectures and 10 seminars in the 10th term. Introduction of the students to the economic problems of the veterinary service has been in charge of Professor S. Zsarnóczai and Professor L. Várnagy, and of the Senior Lecturer L. Visnyei, whereas the lecturers and seminars on the practical application of economic knowledge at various levels of veterinary activity have been entrusted to invited lecturers, recruited from among the most outstanding specialists of the field.

Use of computer techniques in the veterinary service

This subject has been added to the veterinary curriculum recently, in the academic year 1986/87. The course in computer techniques covers one lesson every week in the ninth term, and has been prescribed for end-term examination.

The purpose of the course is to introduce the students to computerized methods of data processing, storage and problem solution with special regard to their applications in veterinary administration, practice and research. The course has been in charge of Béla Benedek Kékesi, Doctor of Veterinary Medicine and graduate of the Technical University, too.

Department and Clinic of Surgery and Ophthalmology

Surgery, farriery, X-ray techniques, ophthalmology, anaesthesiology

J. ZÁJER

Surgery

The first trainees of the Budapest veterinary school, founded in 1787, had been students of medicine and surgery. Professor Tolnay (1748–1818) had instructed them in special aspects of veterinary surgery in the framework of the prescribed course in medical surgery. In the period 1788–1808, the textbook written by the Viennese professor, Wolstein on wound healing in animals had been prescribed for use of the undergraduates of the Medical Faculty of the University of Pest. Professor Tolnay had translated that book to Hungarian, and had it published on his own expense. In 1804, Tolnay published his own book on the "Internal and External Diseases of Horses"; this book comprised the contemporary knowledge on veterinary surgery. Of Tolnay's successors Román Brunkala (1782–1823), Master of Surgery, had introduced the students to basic surgical techniques.

A later successor, Professor Hoffner (1794–1841) had already held a prescribed course for veterinary students in "the special surgery and wound dressing" and had, in 1828, translated Konstantin Balassa's German book entitled "Farriery without restraint"; this book goes down in veterinary history as a relic of early literature on hypnosis in animals.

Vilmos Zlamál (1803–1886) had advocated the extension of training in veterinary surgery from fundamental techniques to the surgical relief of "external diseases". However, this extension was postponed until the academic year 1865/66, when Ferenc Varga, Assistant Professor, began to give five lessons a week in "special surgical techniques, dressing and instruments".

Ferenc Varga (1835–1898) had been the first Professor of Veterinary Surgery in this country, and the organizer and founder of the Department of Surgery in the veterinary school (1870). He had come from the school of the famous Hungarian medical surgeon, Balassa, and went abroad on a study tour after his appointment to the chair. The Clinic of Veterinary Surgery had been opened in 1881, and had long been the pride of the school (then Veterinary Academy). The display contributed by the Department of Surgery to the Millenary Exhibition in 1896 was widely appreciated. The instruments available to the Department satisfied the contemporary requirements of aseptic surgery. Professor Varga raised veterinary surgery to medical standards. In 1888, when he was appointed Director of the school, he entrusted Assistant Professor Béla Plósz with the management of the clinic.

Béla Plósz (1863–1945) went abroad on a 10-month study tour in 1891. He worked in the surgical clinic of Professor Bayer in Vienna, and studied the latest techniques of veterinary surgery in several institutions of Germany and France. He was appointed Ordinary Professor of Surgery after the retirement of F. Varga in 1897.

B. Plósz had initiated the reconstruction of the Clinic of Surgery to cope with the newest trends of development. His greatest merit was the introduction of medical standards in surgical sterility. In his hands formerly rarely applied and hazardous interventions had become successful routine operations. He instructed the undergraduates in interventions in the manner in which these could be performed in veterinary practice, but always emphasized the importance of sterility. He developed and introduced new methods of surgical correction and cure, and, if required, modified and re-devised them. He also introduced doping, general, conduction and local anaesthesia to facilitate and to improve operations upon animals, and diagnostic anaesthesia for studies into the source and causes of limp. He raised ovariectomy in sows to the level of a veterinary intervention.

Mention should be made of the display of veterinary surgical instruments presented by Ferenc Varga and Béla Plósz at the Millenary Exhibition in 1896. It had then been a novelty that these instruments satisfied the criteria of surgical sterility. Béla Plósz also displayed at the Millenary Exhibition excellent ophthalmological instruments, which are still available in the museum collection of the Department. The collection of surgical preparations, founded by Professor Plósz for the purpose of demonstration to students, had become the largest among similar collections in possession of the school by the end of World War II, and its best items are still cherished as valuable museum pieces.

B. Plósz published his reports in Hungarian and foreign journals mainly on surgical problems ("Operation of glottic paralysis by Möller's technique"; "Surgical treatment of hoof cancer"; "Operation of cryptorchid stallions"; "Local anaesthesia"; "Correction of glottic paralysis by surgical removal of Morgagni's mucosal sinus", etc.). These publications enable posterity to get an insight into the profound surgical knowledge and skill of B. Plósz. He also wrote several textbooks and manuals on surgery and surgical techniques (from 1897); these volumes are among the first pieces in these subjects of Hungarian veterinary literature.

Mihály Berrár (1884–1929) succeeded B. Plósz in the Chair from 1920 to 1929. He was an outstanding scientist also versed in physiology and histology, an excellent teacher and professional writer, and the first veterinary ophthalmologist of this country; he elaborated several simple methods and instruments for ophthalmological examinations on animals.

M. Berrár had made a round-the-world tour (Egypt, India, China, Burma, Japan, America and Great Britain) in 1910, and several as Chief Veterinarian

of an Army Hospital in World War I. During this service he collected abundant material on ophthalmological problems, to which he added newer observations later, and investigated the etiology and pathology of certain bone fractures (first and second phalangeal and sesamoideal), and bone and tendon inflammations (sesamoideal, deep phalangeal extensor tendon). His case reports on surgeries ("Castration with emasculator"; "Radical surgical correction of purulent podotrochleal bursitis") are still remarkable. The emasculator originally constructed by Berrár is still used for the castration of stallions. His workers, and other veterinarians working for the degree of Doctor of Veterinary Medicine in the Department of Surgery, elaborated further aspects of the surgical problems pioneered by Berrár, and wrote reports on the mechanical function and strength of the superficial and deep digital extensor and inter-osseal muscles, on chronic inflammations of the mandibular, carpal and tarsal joints, on dental caries in the horse, on urolithiasis in domestic animals, on ovariectomy in pigs and carnivores, on the therapy of actinomycosis, etc. As a proof of his broad and profound knowledge in the subject, Berrár published his excellent two-volume manual of veterinary surgery and ophthalmology in 1924.

His successor Endre Gy. Guoth (1885–1978) had joined the Department as assistant to Professor Plósz immediately after his graduation. He was especially interested in surgical diagnostics and diseases of the foot, and was sent to Germany on a one-year study tour. On his return in 1915, he was entrusted with leading the Farrier's School. In 1925, Guoth published a textbook on "Care and Diseases of the Hoof and Claws". After the untimely death of M. Berrár, Guoth was appointed Head of the Department and Clinic of Surgery and Ophthalmology (1929). He soon incorporated the Farrier's School into the Department, and established an X-ray laboratory unit in the new Clinic of Surgery built during his professorship. His manual on surgical diagnostics and general surgery was published in 1944.

Gyula Kómár (1904–1968) joined the Department in 1929 as assistant to Professor Berrár. In 1931, he worked for several months in the surgical clinic of the Vienna Veterinary College, mainly to study X-ray techniques. He served as Head of the Department and Clinic of Surgery and Ophthalmology from 1948 to 1957.

Gy. Kómár was equally interested in the theoretical and practical aspects of surgery. He himself performed all kinds of diagnostic and surgical interventions but, as all specialists, he, too, had his favourite fields. He preferred operations upon the hoof, including the radical solution of hoof cancer according to a technique developed by himself, the surgical correction of cryptorchid stallions, and all kinds of ophthalmological interventions. He was always ready to introduce new surgical techniques, for example, fixing fractures of long bones by medullary pins, rumen incision and preparations for abdominal surgery on horses were initiated in the Department during his professorship. Genera-

tions of veterinary students and graduates used Kómár's textbooks, which are now treasured as rare items of veterinary libraries.

András B. Kovács (1925–1981) had been on the staff of the Department from 1951. He was awarded the "Candidate of Science" degree in 1956, and was appointed Head of the Department in 1957.

His research interest had initially been centered on wound healing. From the 'sixties he investigated the surgical problems of intensively managed animals under the evolving large-scale farming systems. He was awarded the higher postgraduate degree "Doctor of Veterinary Science" in 1973, for a thesis written on the foot diseases of artiodactylic domestic animals. The first major revision of the school's training programme after World War II fell into B. Kovács's office period as Rector; this revision affected, among others, the reduction of the content of surgical instruction to about one third, owing to the decline of work horse breeding. Professor B. Kovács published several textbooks and over a hundred research papers. He constructed handy new instruments to improve the operation techniques. In 1980 he served as President of the European Society of Veterinary Surgery (ESVS); in that year the 13th Congress of the ESVS was held at this University.

B. Kovács's successor in the chair, László Tamás (1923) was appointed Head of the Department in 1981, and Professor in 1982. He has been on the staff of the Department since his graduation in 1946, and although deeply engaged in clinical work, he maintained research interests mainly in the problems of blood and plasma transfusion. For a dissertation written on that topic he was awarded the degree "Candidate of Veterinary Science" in 1955. He published about 50 research papers and compiled independently or in co-authorship 16 textbooks, manuals and scripts.

The present Clinic of Surgery and Ophthalmology is provided with accommodation for 20 large and 60 small animals. One Dräger-type apparatus is available for the inhalation anaesthesia of large animals, and three such devices are available for small animals. An AO set of bone surgery instruments, the X-ray unit, and laboratory units for histology and biochemical tests satisfy all criteria of up-dated veterinary surgery. Two operating theatres furnish sterile conditions for the surgical operations.

Farriery

Introduction to diseases of the foot has been an important part of the training programme of this school from the beginning, and instruction in farriery as an associated subject had been in charge of a special teacher until 1933. The teaching of farriery had been initiated by Sándor Tolnay in 1799, and in 1800, a workshop had been erected in the school campus for practical instruction, which had been the responsibility of the farrier Ferenc Hangl.

By governmental decision a winter course was opened for the extension training of practising farriers. The programme of the course was elaborated by S. Tolnay in 1802. Further to horse-shoeing, the trainees had been introduced to contemporary veterinary art. F. Hangl was suceeded by other shoeing-smiths in tutoring the course.

In the academic year 1848/49, a three-month course was initiated for training shoeing-smiths in charge of cavalry regiment horses; Vilmos Zlamál, Alajos Szabó and Márton Galambos, then professors of the veterinary school, served as teachers. The first book on farrier's art was published in Pest in 1866.

The training of military shoeing-smiths also versed in veterinary art had been ordered by Maria Theresia in 1776. The training course, which had initially lasted three months, was extended to two years in 1860. The trainees were entitled to open their own shoeing-smith's shop and the best of them were sent to a course in veterinary art, which entitled them to serve as veterinary technicians in the army, or to start—after sitting for a special examination—a veterinary practice in civilian life (1889); they also held a permit for performing vaccinations. This type of technician training was segregated from veterinary education on the proposal of Hutÿra in 1899.

In the period 1882–1914 Ármin Schwenszky served as teacher of farriery in the veterinary school; after initial difficulties stemming from reorganization of the latter he succeeded in founding a farrier's school affiliated to the institution of veterinary higher education, to teach farrier's art as an independent subject.

Schwenszky investigated the diseases of the organs of motion and took a special interest in their therapy: orthopaedy. He devised and constructed special instruments for examination of the hoof, including an electric device for determination of hoof loading. He maintained close connections with fellow scientists abroad, and was esteemed for his profound knowledge of the field. Schwenszky's horseshoe collection, displayed by him at the Millenary Exhibition in 1896, is treasured in the University as an invaluable relic. The collection comprises the horseshoes used in contemporary Europe, and a special set of iron shoes for orthopaedic use. Schwenszky published many papers on farriery subjects and diseases of the hoof in both Hungarian and foreign journals. His book on farriery, written in co-authorship with Béla Nádaskay, saw three editions within 17 years.

After Schwenszky's retirement Endre Gy. Guoth, Assistant Professor, was entrusted with teaching farriery. From 1934, the entire content of the farriery course was integrated into the subject "Surgery I". An end-term examination in farriery was prescribed until shortly after World War II. Guoth was a reputed specialist of the field both home and abroad; his manual entitled "Care and Diseases of the Hoof and Claws" is still useful. After World War II, the horse stock of the country was reduced to one tenth of its pre-war size, and

farriery lost its previous importance. For the last decades, it has been the subject of a few lectures only in the training programme of surgery.

X-ray techniques

The first X-ray device was procured by the school in 1929, but it did not last long. In 1931 a new, larger device was installed which was in operation, with occasional improvements, until 1954. In the same year a then up-to-date four valve device, with two working posts, fitted with a rotating anode amplifying tube of about 250 kW performance was purchased; it was dismantled in 1969, when the reconstruction of the Department was started in the interests of the construction of a new X-ray laboratory unit. The construction works were finished in 1971, a THY 250 deep therapy and a Contrastor 150 six valve diagnostic device was built.

The development of X-ray diagnostics was started in the school by Gyula Kovács, Titular Professor, who was in charge of X-ray work from 1934 to 1947 (he was subsequently appointed Professor of Anatomy). Then Ferenc Fellner, Senior Lecturer, took charge of the X-ray unit; in 1972, he wrote a manual for the undergraduates on fundamentals of veterinary roentgenology.

Ophthalmology

Veterinary ophthalmology developed to an independent subject from a branch of surgery in all veterinary schools. In this school B. Plósz, Professor of Surgery, translated H. Möller's German textbook of veterinary ophthalmology into Hungarian for the use of undergraduates.

The history of veterinary ophthalmology as an independent subject dates back to 1921. The first Hungarian textbook of veterinary ophthalmology was published by Professor Berrár in 1924. The development of the discipline was linked with his activities. Berrár and his co-workers were intensively engaged in ophthalmological research. Berrár and Manninger postulated by etiological investigations into the periodic ophthalmia (moon blindness) of horses the toxic rather than infectious nature of the disease, claiming that toxic proteins absorbed from the intestinal tract might be responsible for the symptoms and their recurrence. Although the etiology of moon blindness is still poorly understood, the original approach of Berrár and Manninger to the problem is still appreciated.

During Berrár's professorship, candidates for the title Doctor of Veterinary Medicine compiled several theses on ophthalmological topics, such as the fundus of the equine eye, certain forms of equine and bovine myopia, astigmy

of the ocular lens in horses, experimental induction of cataract in the eyes of horses and pigs, persistence of foetal vascularization in the lamb eye.

During the professorship of Gy. Kómár, in 1952, Kemenes and Tamás demonstrated that the etiology of periodic equine ophthalmia might be explained as an allergic reaction to leptospira infection. Kómár's textbook on "Veterinary Ophthalmology" was published in two editions (1953, 1961). László Szutter, Titular Professor, also gave lectures on veterinary ophthalmology and wrote in co-authorship with Gy. Kómár a German manual on veterinary ophthalmology (1968), which was translated into Japanese (1971).

L. Szutter (1891–1973) served between the two World Wars as veterinary officer to the army mainly in national studs. His examinations on the horses' eyes disclosed new morphological details of the fundus of the eye. In 1939 he was appointed Titular Reader, after World War II Titular Professor, of this school. He was awarded the higher postgraduate degree "Doctor of Veterinary Science" for his investigations into postnatal changes in the eye of newborn animals.

Recently an Ophthalmological Consulting Body has been in charge of eye diseases at the University.

Anaesthesiology

Local and general anaesthesia as a sparing substitute for drastic physical methods of restraint was described in detail for the first time in B. Plósz's manual on surgical techniques (1897).

From the early 'eighties, about 10–12 lectures are devoted to anaesthesiology in the seventh term, with practicals added to the course.

Faculty of Veterinary Engineering

I. Facsar

The school of Veterinary Engineering has been affiliated to the University of Veterinary Science as its Faculty since 1979. Its seat is the large provincial town Hódmezővásárhely and it trains so-called *veterinary production engineers** in a three-year course of instruction. The training programme covers introduc-

* In Hungary, the diploma of production engineer is generally awarded to high-school graduates who read a three-year course of instruction in technical, agricultural, etc. higher schools. Holders of these diplomas serve either as graduated assistants to university graduates, or take independent positions not requiring university education.

tion to the hygienic and managemental measures of animal disease prevention in considerably greater detail than the curriculum of the livestock production engineers. Professional instruction is in charge of six Departments (of Animal Health, Animal Hygiene, Animal Husbandry, Technology, Animal Nutrition, Farm Management) staffed with a total of 36 teachers. Several well-equipped laboratories, a Livestock Breeding Unit and a School Farm run by the Faculty promote training in the theoretical and practical aspects of the profession. The more than 300 veterinary production engineers having come down from the Faculty since its foundation have been employed about half-by-half in farm-level veterinary and livestock production services, in jobs not requiring veterinary medical education, and several of them have been welcome co-workers of veterinary laboratories and gestor farms.

The teachers of the Faculty have, in addition to their educational responsibilities, taken interest in various topics of applied research. Their contributions to special aspects of ovine reproduction biology, interrelationships between mastitis and environmental hygiene, disease prevention in large-scale rabbit farming, etc. deserve special mention.

The Faculty has been in charge of postgraduate refresher courses for its own graduates and livestock production engineers, and has the sole competence in Hungary for courses leading to postgraduate specialization in animal hygiene and wildlife husbandry for holders of a degree in livestock or veterinary production engineering.

Veterinary History

D. Karasszon

The first professor, Sándor Tolnay (1748–1818), has already informed his students about the development and history of veterinary medicine, science, administration and education both in his lectures and textbooks. Although his successors, at his Department, followed this tradition, the first more considerable written work about veterinary history entitled "History of the veterinary science and of our veterinary school" was published by Lajos Tanhoffer, Professor of Physiology, in 1888 for the centenary of the Hungarian veterinary training. Partly due to the publication of this book the teaching of veterinary history has already been included in Hutÿra's reform curriculum implemented from 1890 on. The lectures were held by Ferenc Tangl, Professor of Physiology, and later by Gyula Magyary-Kossa, Professor of Pharmacology and Toxicology. The latter was an outstanding medico-historian, who has enriched, by some considerable writings, the literature of veterinary history as well. Especially important is his book entitled "Hungarian veterinary bibliography, 1472–

1904" published in 1904 as well as the catalogue of the library of the Veterinary College which contains the exact description of numerous book curiosities as well. After him Tibor Győry, Professor of Medical History at the Medical Faculty of University of Science, was lecturing in veterinary history and carried out valuable research especially in the history of veterinary higher education. When Professor Győry, who as an under-secretary of state, became one of the leading personalities of the Hungarian health administration, retired from lecturing, he gave his place to András Daday, Doctor of Medicine, Titular Lecturer of the Medical Faculty. A. Daday was prominent mainly in the research of the history of popular zootherapy and he set up an incomparable museum of veterinary history which was demolished in World War II.

In the meantime, for the 150th anniversary of the Hungarian veterinary higher education the Academic Board invited Sándor Kotlán, Professor of Parasitology, to write the history of the Hungarian veterinary education. The work of 210 pages, illustrated by 113 Figures, contained exact archival data. It was published in 1941 and has ever since been an invaluable source of the history of Hungarian veterinary education.

After a long pause the matter of teaching veterinary history was resumed in 1969. On the basis of his research activities in the subject, Dénes Karasszon (1925), Doctor of Veterinary Medicine, was requested by the Rector to hold lectures for the veterinary undergraduates. At first the lectures were facultative for the students but later they became compulsory. In 1976 D. Karasszon was asked to start and collect and systematize material for an exhibition on veterinary history. From this exhibition, which was completed by the time of the inauguration of the new complex of university buildings and of the aula, on the basis of the preparations made by D. Karasszon and Mrs. I. Bakonyi, a permanent exhibition of veterinary history has evolved which has been referred to the care of the Central Library of the University.

APPENDIX

Honorary ("honoris causa") doctors of the institution (University of Veterinary Science and its legal predecessors)

Schütz, W.	Emeritus Professor	Berlin 1910
Nádaskay, Béla	Emeritus Professor	Budapest 1918
Darányi, Ignác	Emerited Minister of Agriculture	Budapest 1924
Breuer, Albert	Director of the Municipal Abattoirs	Budapest 1924
Cselkó, István	Professor of Agricultural Academy	Budapest 1924
Fokányi, László	Chief Counsellor for Animal Health	Budapest 1924
Plósz, Béla	Emeritus Professor	Budapest 1924
Uhlyárik, Titusz	Chief Counsellor for Animal Health	Budapest 1924
Bang, B.	Emeritus Professor	Copenhagen 1924
Bayer, J.	Emeritus Professor	Vienna 1924
Dexler, H.	Emeritus Professor	Prague 1924
McFadyean, J., Sir	Director of Veterinary College	London 1924
Kitt, T.	Emeritus Professor	Munich 1924
Mohler, J.	Director, Bureau of Anim. Ind.	Washington 1924
Schmaltz, R.	Emeritus Professor	Berlin 1924
Smith, Th.	Division Head, The Rockefeller Institute	New York 1924
Zschokke, E.	Emeritus Professor	Zürich 1924
Marek, József	Professor	Budapest 1926
Angeloff, S.	Professor	Sofia 1962
Diernhofer, K. L.	Professor	Vienna 1962
Dobberstein, J.	Emeritus professor	Berlin 1962
Kotlán, Sándor	Professor	Budapest 1962

Manninger, Rezső	Professor	Budapest 1962
Mócsy, János	Professor	Budapest 1962
Ramon, G. L.	Emerited Director	Paris 1962
Skryabin, K. I.	Professor	Moscow 1962
Zimmermann, Ágoston	Emeritus professor	Budapest 1962
Mosgov, I. J.	Professor, Member, Acad. Sci. USSR	Moscow 1975
Brill, J.	Emeritus Professor	Warsaw 1975
Kovács, Gyula	Emeritus Professor	Budapest 1975
Sályi, Gyula	Emeritus Professor Member, Hung. Acad. Sci.	Budapest 1975
Beer, J.	Professor	Berlin 1977
Kalich, J.	Professor	Munich 1977
Polyakov, A. A.	Professor	Moscow 1977
Willinger, H.	Professor	Vienna 1977
Siegmann, O.	Professor	Hannover 1981
Kovács, Jenő	Emeritus Professor	Budapest 1984
Bürki, F.	Professor	Vienna 1985

Members of the Hungarian Academy of Sciences among the professors of the institution

Name and university degree	*Year of election*
Bugarszky, István, chemical engineer	
Corresponding Member	1899
Csukás, Zoltán, doctor of veterinary medicine, livestock production engineer, economist	
Corresponding Member	1954
Doby, Géza, plant biochemist	
Corresponding Member	1934
Ordinary Member	1946
Entz, Béla, doctor of medicine	
Corresponding Member	1945
Gróh, Gyula, chemical engineer	
Corresponding Member	1925
Ordinary Member	1936
Győry, Tibor, medical historian	
Corresponding Member	1933
Hoffner, József, doctor of veterinary medicine	
Corresponding Member	1832

Horn, Artúr, livestock production engineer
Corresponding Member 1961
Ordinary Member 1967
Hutÿra, Ferenc, doctor of medicine, doctor of veterinary medicine
Corresponding Member 1910
Ordinary Member 1921
Kotlán, Sándor, doctor of veterinary medicine
Corresponding Member 1946
Ordinary Member 1951
Kovács, Ferenc, doctor of veterinary medicine
Corresponding Member 1976
Ordinary Member 1982
Magyary-Kossa, Gyula, doctor of medicine, pharmacologist, veterinary historian
Corresponding Member 1920
Manninger, Rezső, doctor of veterinary medicine
Corresponding Member 1927
Ordinary Member 1939
Marek, József, doctor of veterinary medicine
Corresponding Member 1918
Ordinary Member 1938
Mészáros, János, doctor of veterinary medicine
Corresponding Member 1976
Ordinary Member 1982
Mócsy, János, doctor of veterinary medicine
Corresponding Member 1941
Ordinary Member 1946
Preisz, Hugó, doctor of medicine, bacteriologist
Corresponding Member 1912
Ordinary Member 1923
Rátz, István, doctor of medicine, doctor of veterinary medicine
Corresponding Member 1903
Sályi, Gyula, doctor of veterinary medicine
Corresponding Member 1962
Schandl, József, livestock production engineer, doctor of veterinary medicine
Corresponding Member 1953
Ordinary Member 1960
Szabó, Zoltán, botanist
Corresponding Member 1932
Ordinary Member 1941

Szent-Iványi, Tamás, doctor of veterinary medicine
Corresponding Member 1973
Ordinary Member 1979
Tangl, Ferenc, doctor of medicine
Corresponding Member 1902
Ordinary Member 1910
Thanhoffer, Lajos, doctor of medicine
Corresponding Member 1880
Ordinary Member 1891
Tormay, Béla, livestock production engineer, doctor of veterinary medicine
Corresponding Member 1899
Wellmann, Oszkár, doctor of veterinary medicine
Corresponding Member 1936
Ordinary Member 1941
Zimmermann, Ágoston, doctor of veterinary medicine
Corresponding Member 1922
Ordinary Member 1935
Zlamál, Vilmos, doctor of veterinary medicine
Corresponding Member 1864

Holders of State Prizes among the teachers of the institution

Name	*Year of award*
Csukás, Zoltán	1954
Horn, Artúr	1978
Kotlán, Sándor	1951
Kovács, Ferenc	1983
Manninger, Rezső	1950, 1961
Marek, József	1949
Mészáros, István	1963
Mészáros, János	1983
Mócsy, János	1952, 1970
Sályi, Gyula	1955
Schandl, József	1954
Szent-Iványi, Tamás	1983
Zimmermann, Ágoston	1957

Holders of the József Marek Memorial Medal

This medal, issued by the University to Hungarian and foreign eminent persons as an award of merit, was founded in 1974

Mócsy, János	Emeritus Professor, Member, Hung. Acad. Sci.	Budapest 1975
Köves, János	"Doctor of Veterinary Science"	Budapest 1975
Erőss, István	Retired District Chief Veterinarian	Nagyatád 1975
B. Kovács, András	University Professor	Budapest 1975
Danilevski, V. M.	Rector	Moscow 1975
Vrtiak, O. J.	Rector, Member, Acad. Sci. ČSSR	Košice 1975
Kovács, Jenő	University Professor	Budapest 1976
Várnagy, László	University Professor	Budapest 1977
Fodor, László	Director-General of Finance	Budapest 1977
Nyiredy, István	"Doctor of Veterinary Science"	Budapest 1977
Landy, László	District Veterinarian	Enying 1977
Bisping, W.	University Professor	Hannover 1977
Mehlhorn, G.	University Professor	Leipzig 1977
Hiepe, Th.	University Professor	Berlin 1977
Rosocha, J.	University Professor	Kosice 1977
Siegmann, O.	University Professor	Hannover 1977
Lötsch, D.	University Professor	Berlin 1978
Schulze, W.	University Professor	Hannover 1978
Biggs, P. M.	Director of Research Institute	Houghton, 1979 (U.K.)
Kovács, Ferenc	University Professor	Budapest 1979
Kardeván, Andor	University Professor	Budapest 1980
Szent-Iványi, Tamás	University Professor	Budapest 1984
Mészáros, János	University Professor	Budapest 1985


Bibliotheca Academiae Scientiarum Hungaricae
MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

PRINTED IN HUNGARY
Akadémiai Kiadó és Nyomda, Budapest