

# The Development of Dental Medicine in Croatia

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## Summary

*The roots of modern dental medicine, as a scientific medical branch, go back to 1728, when Pierre Fauchard published his paper entitled "Le chirurgien dentists où traité des dents". Diseases of the oral cavity, particularly diseases of the teeth, have plagued man from his very beginning, as have attempts to treat diseases of the mouth and teeth.*

*Dental medicine in Croatia developed in a similar way to other European countries, and in accordance with the social and material conditions in the country. As early as the 13th century coastal towns had services with permanent physicians physics, surgeons, pharmacists and barbers (lower surgeons). In 1777 Dubrovnik was first to establish a dental-medical service as a separate branch of general health protection.*

*Dental medicine developed later in the interior of Croatia. For example, in Zagreb at the end of the 18th century and beginning of the 19th century one could come across people engaged exclusively in dentistry, and in the 19th century a town dentist was appointed. At that time foreigners carried out the work of educated dentists, and it was individual, independent and based on profit.*

*With effect from the 1920s the public service of dental medicine rapidly developed (school, town and national polyclinics). In large centres (Osijek, Split, Rijeka and Zagreb) polyclinics were founded, and in Zagreb, in 1931, a Dental Clinic. In 1959, it was possible to specialise in two branches of dental medicine in Croatia. Today dentists can specialise in eight branches. The need for permanent training should be stressed, which is included in the Law on Health.*

*The prevalence of diseases of the mouth, oral cavity, teeth and jaws in Croatia is high. At the beginning of 1979 International Classification of Disease in Dental Medicine (ICDD) was introduced in Croatia for a determined number of diseases (dental caries, periodontopathy, orthodontic anomalies, malignant tumours of the mouth, cleft palate ...)*

*Education in dental medicine commenced in 1922 with the establishment of the Department of Dental Medicine and Dentistry at the Medical School in Zagreb, with the first teacher, Eduard Radošević. Although founded in 1931 the Dental Clinic actually opened in 1939 in a newly erected building at Široki brijeg, Šalata, with Ivo Čupar as Head. He was Head of the Dental Clinic for thirty years. In 1945 the Higher Dental School was founded in Split and in 1947 a similar school in Zagreb. In 1948 the Odontological Section was established at the*

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School of Medicine in Zagreb, which later became the independent School of Dental Medicine University of Zagreb in 1962. The first Dean of the School was Živko Bolf. In 1973 the study of dental medicine was established within the framework of the Medical Faculty in Rijeka.

Scientific-research in dental medicine has continued for more than 100 years. Initially by individuals, today the increased number of investigators has created a critical mass for the establishment of a Centre for Interdisciplinary Activity in Dental Medicine.

The written word has been present for decades in journals (*Folia stomatologica*, which sadly ceased to be published in 1950, *Acta Stomatologica Croatia*, with effect from 1966 and the *Croatian Dental Herald* since 1993) and in numerous scripts, manuals, textbooks and more recently the Internet pages.

The social organisation of the profession started in 1903 with the founding of the Society of Croatian Dentists. Today we have the Croatian Dental Society and several specialist societies within the framework of the Croatian Medical Association, and with effect from 1995 the Croatian Dental Chamber. Following the founding of the independent School of Dental Medicine in Zagreb in 1962 the structure of highly educated staff in dental medicine improved in Croatia, and during the 1960s and 1970s there was a significant "export" of dentists to European countries (e.g. Federal Republic of Germany, Switzerland).

Today, unfortunately, we still cannot claim a significant reduction in dental caries and its consequences in the population of Croatia.

Key words: dentistry, dental medicine, Croatia, history.

## Introduction

The roots of modern dental medicine, as a scientific medical branch, go back to 1728, when Pierre Fauchard (1) published a paper entitled "Le chirurgien dentiste où traité des dents". However, diseases of the oral cavity, and particularly of the teeth, have followed man since his very beginning, as have attempts to treat diseases of the mouth and teeth.

In the past Croatia was often divided by foreign national systems and therefore developed under the influence of such foreign systems. The interior of the country was for centuries under the influence of the Austro-Hungarians, and a part of the country under the influence of the Turks. On the other hand the coastal area was under the influence of the Venetians, the French and the Austrians. This all had a strong influence on regional development of health culture in Croatia, and consequently also dental medicine.

## Organisation of dental health care

Coastal towns, such as for example, Dubrovnik, in the 13th century already had a service of permanent physicians physics, surgeons, chemists and barbers (lower surgeons). The dental health service in Dubrovnik was performed as a rule by surgeons and barbers, or lower surgeons. As treatment of the teeth was a secondary occupation, they frequently had competition from among charlatans etc. (2). The main intervention in the treatment of teeth was in fact their extraction. An inventory of a Zadar surgeon-barber FIORINIJA in 1625 shows the instruments which he used to perform surgery, gynaecology and dentistry (3).

In 1777 a central medical service was founded in Dubrovnik as a secondary branch of general health protection. The head of the service was Gaetano PIERINI, a dental physician (chirurgo-

dentista) who had come to Dubrovnik from Italy. He was paid 12 dinars a day. Public health services also developed along similar lines in other Dalmatian towns. In those days the educated experts were mainly foreign (2).

In the interior of Croatia health conditions in the 18th century were extremely poor. As there were only four physicians in the whole of Croatia and Slavonia in 1770, it would be unrealistic to assume that they had had time to engage in the treatment of teeth. At that time in the village centres the role of barber and the occasional skilful self-taught was irreplaceable. Knowledge was gained with the help of various medical books, calendars and similar publications (4).

At the end of the 18th and beginning of the 19th century there was one person in Zagreb who was exclusively engaged in dentistry (5). At that time barber-surgeons already existed in other towns in the interior of the country (6). As the number of surgeon-barbers increased, they founded a guild to protect their interests. Some of them gained great social reputation. For example, on the 8th January 1430 King Sigismund bestowed the rank of noble on the Zagreb barber, Mihajlo DAB, for services rendered. His coat-of-arms consisted of three silver teeth and a hand holding a tooth over a helmet on the shield (7).

At that time the only work on teeth was their extraction. Treatment to ease dental pain was achieved with various preparations, most frequently of plant or animal origin (4).

Apart from the surgeon-barber military surgeons were also active in Croatia from the end of the 18th century until the beginning of the 1870s of the 19th century, when the School for Military Surgeons in Vienna closed and the study of medicine was introduced (1872). At the end of the study students obtained the title doctor medicinae universae (8).

During the 19th century seasonal dentists of varying knowledge, diplomas and equipment worked in many Croatian towns, and advertised in the local newspapers. In Zagreb such newspapers were *Agrarmer Zeitung* (from 1827) and *Narodne novine* (from 1835) (5, 9), in Zadar *Narodni list* and *Il Dalmata* (3). Most of these dentists were foreign, and with regard to qualifications they ranged from dental master, dental mechanic, dental physician, to, more

rarely, doctor of medicine. They usually worked for several weeks or months in the local inn. In their advertisements they often boasted of working with the most modern methods, e.g. French or English, and of owning gold and platinum equipment with which patients not only looked good but also which could also be used for food! Many advertised the use of gold and silver alloys, and regulation of asymmetric teeth (3, 5). However, in the 19th century large towns employed town dentists. Thus for example on 22nd May 1866, after an advertisement, the Government of Zagreb named Josip Hafner, master of dentistry, as the town dentist (5).

Josip HAFNER worked in Zagreb for 42 years, up until his death on the 24th August 1908. In 1885, on the basis of his excellent work, he was accepted as a member of the Association of Physicians of the Kingdom of Croatia and Slavonia, in spite of the fact that he was not a physician (5).

At the end of the 19th century in the large town centres of Croatia there was a significant increase in the number of doctors of general medicine, who had specialised in dental medicine at other universities (Vienna, Graz, Budapest, Prague, Padua, Bologna). There were also dentists who had graduated at high schools for dental medicine in Germany, Switzerland or in the United States of America. Thus dental doctors Mate GJIVOVIĆ (graduated in Philadelphia), Niko GJIVOVIĆ (graduated in San Francisco) and Josip Mario VEŽA (graduated in Baltimor) advertised in the Zadar newspaper "*Narodni list*" or "*Il Dalmata*" (3, 5).

Regardless of the increase in number and quality of health workers in Croatia during the 19th century the accent was still on the village population. In fact up until the end of serfdom in 1848 the aristocracy, priests and townsfolk politically represented the people. The basis of organised insurance in Croatia started in 1891, and did not include teeth. The work of the dentist was individual, independent and based on profit. This obviously did not include elected town dentists, who, as was the case in Zagreb, were obliged to "... allot two hours every day for free examination and extraction of the teeth of the towns poor". Schoolchildren and adolescents were not included in organised dental care (4, 5).

Due to the efforts of Andrija ŠTAMPAR, a School Polyclinic was opened in Zagreb on the 1st September 1924, in which dentists worked. Later

school, town and national polyclinics were established throughout the country, which enabled better care for the teeth of adolescents (10, 11). Private physicians-dentists concluded agreements with so-called patient funds, or central offices of social insurance, and in this way, albeit relatively meagrely, the inhabitants of Croatia were able to obtain dental help from public funds. A model for health care of the population by means of National Health Clinics was founded by Andrija ŠTAMPAR in 1927, in the Kingdom of the Serbs, Croats and Slovenes (from 1929 Yugoslavia), which gave impetus to social-hygiene dental work (12). At the beginning of 1936 the Union of Dental Societies of Yugoslavia launched its preparations for hygiene of the mouth and teeth, under the name "SISTOM". They were sold throughout the country up until the beginning of the Second World War (13) with varying success. "SISTOM" preparations were manufactured in Zagreb.

After 1947 the public dental service began to rapidly develop. Thus, in 1947 the Central Dental Clinic (14) at Perkovca Street in Zagreb was founded, from which, in 1953, the Dental Polyclinic was established.

With the reorganisation of the health service during the 1960s medical centres arose in Croatia which included services for the protection of the mouth and teeth. The founding of dental polyclinics also occurred in other large centres such as Osijek, Split and Rijeka. In 1961 the Dental Polyclinic at the School of Medicine was founded in Zagreb.

Specialisation in some branches of dental medicine in Croatia began in 1959, when only two were envisaged, i.e. orthopaedics of the jaws with prosthetics and maxillofacial surgery. Later branches of specialised dental medicine changed in Croatia. For many years (from 1970 to 1994) they consisted of specialisation in oral surgery, orthodontics, dental prosthetics, children's and preventive dental medicine and dental and oral pathology with periodontology.

The deep social and economical changes in Croatia over the last ten years also included health care. Today health care is based on primary, specialist-consultation and hospital levels. Today dentists in Croatia may specialise in: 1. family dental medicine, 2. dental prosthetics, 3. orthodontics, 4. pedodontics, 5. dental pathology and endodontics, 6. oral pathol-

ogy, 7. periodontics and 8. oral surgery. Important qualitative and quantitative changes have taken place in postgraduate study of dental medicine in Croatia. The need for permanent improvement of dentists is perpetual, and is written in the Law on Health.

### The prevalence of oral disease in Croatia

The prevalence of diseases of the mouth, oral cavity, teeth and jaws in Croatia is high. With the introduction of the International Classification of Dental Diseases (15) in 1977 the World Health Organisation formed basic presumptions for an informative and statistic system of diseases of the mouth, oral cavity, teeth and jaws.

At the beginning of 1979 the ICDD health statistics were introduced in Croatia for a specific number of diseases (dental caries, periodontopathy, orthodontic anomalies, malignant tumours of the mouth, cleft palate ...). The true prevalence of oral diseases in Croatia can only be approximately assessed because of inadequate follow-up and unreliable statistical indicators. However, regardless of the absence of statistic analysis it can be concluded that the leading diseases are dental caries and its consequences, periodontopathy and orthodontic anomaly (16).

### Teaching of Dental Medicine

In 1922 the Board of Professors of the Medical School in Zagreb awarded Dr. Eduard RADOŠEVIĆ, dental physician from Zagreb *zamoljeni venia docendi in dental medicine*. With this act the teaching of dental medicine commenced for students studying general medicine at the University of Zagreb. The same year Dr. Eduard RADOŠEVIĆ published his habilitation paper "The Problems of Dentistry with Regard to Physical Chemistry". He continued his scientific work and in 1935, apart from many other scientific and professional papers, he published a monograph "Physiology and Dental Pathology". It was a brave step to take in dental research in this region, and it had reverberations in the scientific world (17). The building of a Dental Clinic, University of Zagreb was first mentioned during the school year 1931/32. The first Director

was Prof. Eduard Radošević and laboratory worker Slava ABT (18).

Dental work began in 1933 in the outpatient department of the Otorhinolaryngology Clinic, which was in fact the beginning of the future Clinic of Dental Medicine (19).

The Clinic of Dental Medicine opened in September, 1939, in a newly erected building on Široki brijeg, Šalata, with Dr. Ivo ČUPAR as Director. At that time the Clinic consisted of two departments, Dental-Medical and Clinical-Hospital (19).

The death of Prof. Eduard RADOŠEVIĆ in 1939 ended a period of development in the teaching of dental medicine at the Medical School in Zagreb. He was succeeded by Dr. Ivo ČUPAR, who directed the profession towards surgery of the jaw and face (17). Dr. ČUPAR taught "Clinical Dentistry with Practical Exercises" (20). In 1943 another teacher, DR. JURAJ KALLAY, who was Head of the Department of Dental Medicine of the Foundation Hospital Rebro (21), joined the Department of Dental Medicine. Juraj KALLAY was engaged in practical teaching, which he had taught for groups of students at Rebro, and in theoretical teaching he taught the problem of focal infections (22). In 1945, at the end of the war a Higher School for Dental Medicine was founded in Split, which enrolled several generations. In 1946 a School for Dentists was founded in Zagreb which lasted for one year and was ranked as a middle school. In 1947 a higher school for Dental Medicine was founded in Zagreb which lasted for three years and enrolled three generations of students. The school was succeeded by the Odontological Section of the Medical School. In 1948 a Middle Medical School for Dental Technicians was founded in Zagreb, which was the only school of this type in the country (today such schools exist in Zagreb, Osijek, Rijeka and Split, and a partially private school in Bjelovar). Thus education of dental medicine expanded.

After the Second World War the Odontological Section was established in the Medical School in Zagreb. The precise day the Section was established is difficult to determine. Namely, as early as 1947 some documents already gave an outline of regulations for work of the Section. The Teaching Plan for the Medical School University of Zagreb, published in "Narodna novina" in 1948, Item VII, mentioned that a teaching plan would be required for the Odon-

tological Section. In the Teaching Regulations at the Medical School, published the same year, Article 3 mentions the existence of the Odontological Section and states that teaching lasts for five years. Students of the Odontological Section attended the first two years of study together with students of general medicine. In the third year of study the teaching of general medical subjects was separated and teaching of professional odontological subjects continued (23, 24).

The first organisational programmes were carried out in 1949 and 1950. At that time students' practical exercises took place in the premises of the Dental Clinic at Šalata. On several occasions a special committee of the Teachers' Council of the Medical School analysed the possibilities and activities of the Section (23).

The first teachers in the Section were: Dr. Živko BOLF, at the time Assistant of the Clinic of Dental Medicine, and Dr. Miroslav SUVIN (25, 26). Initially these physicians worked part-time. At the beginning of 1951 directions were completed regarding the regime of study in the Section, and thereafter teaching was divided into professional subjects and general medicine and performed simultaneously. Of the total number of hours professional subjects amounted to 40% and general subjects 60%. Particular care was taken to ensure that the teaching of general medicine was in line with higher odontological study. Following a proposal by the Council for Higher Medical Teaching, the Ministry of National Health, Republic of Croatia, issued a Decree on 20th April 1951 on the formation of an Odontological Section at the Medical School in Zagreb. The decree contained eleven articles on teaching regulations, relations with the Medical School and Section and the financing of work etc. (23). The same year the Council of the Medical School in Zagreb advertised for teachers for the following subjects: Material Technique/Technology, Dental Prosthetics, Pathology and Dental Therapy at the Odontological Section.

In 1952 teachers were chosen for other odontological subjects. They were: Dr. Ivo ČUPAR (Professor) Surgery of the Jaw; Dr. Živko BOLF (Teacher) Regulation of Teeth and Jaws; Dr. Miroslav SUVIN (Head of the Department of Dental Prosthetics, Teacher) Clinical Prosthetics; Dr. Zdenko NJEMIROVSKIJ (Part-time Teacher) Pathology and Dental

Therapy; Dr. Dalibor SVOBODA (Part-time Teacher) Odontosurgery; Dr. Vitold RITTERMAN (Part-time Teacher) Pathology and Therapy of the Oral Cavity (27).

When the Department of Odontology at the Medical School was founded Dr. Živko BOLF was appointed Director. The Council of Teachers of the Section was established and headed by Dr. Živko BOLF. The question of appropriate buildings and teaching equipment needed to be urgently solved. The first generation of students studied professional clinical subjects (23, 28). As a temporary solution the Section took over the premises and equipment of the previous Higher School of Dental Medicine. The premises taken over were spread over the whole town and were on the whole dilapidated and neglected. In such circumstances only 30 students were able to attend the exercises. The administration of the Section attempted to solve the problem on several occasions through the Medical School, the University, the Town administration and other corporate bodies. Apart from the regular teaching staff, auxiliary staff were also engaged, which made it possible for the Section to function correctly in spite of the above difficulties (23).

During the following years there was significant progress in teaching, professional and research activities. Teaching was taken over by the Department of Odontology with departments for treating teeth, dental prosthetics, orthodontics, dental surgery and treatment of diseases of the oral cavity.

The first eight students graduated in 1954. The first was Miljenko LAINOVIĆ. The Department of Pathological Morphology was taken over in 1954 by Dr. Blaženka MARKOVIĆ-PEIČIĆ, who, with Dr. BOLF, Dr. SUVIN and Prof. ČUPAR and others, greatly contributed to the progress of the academic teaching of Dental Medicine in this region.

The importance of the study and strong general medical emphasis encouraged students and teachers to start the process of changing the name of the Odontological Section and professional title at the end of study, *doctor medicinae dentium*. The joint effort of teachers and students was successful and in 1957 the Section's name was changed to the Department of Dental Medicine, and the professional title was changed to *doctor medicinae stomatologicae*.

During the next two years preparations for a teaching reform intensified and efforts were made to renovate the building at 5, Gundulić Street, where the main premises are still located today.

In those days the disastrous condition of the oral cavity of the population in Croatia and the lack of appropriate staff induced the Council for National Health of the Republic of Croatia to suggest that the Council of the Medical School in Zagreb propose a reform and shorter study of dental medicine, and to urgently expand the teaching premises of the Department of Dental Medicine at the Medical School (23). Renovation of the buildings at 5, Gundulić Street made it possible to increase the number of students in daily exercises from 70 to 200 (23).

Organisational changes in the school year 1958/59 was reflected in the establishment of five departments:

1. Department of Dental Surgery, Head Dr. Dalibor SVOBODA, Assistant, (Senior Lecturer); Dr. Erich JELINEK, Assistant; 6 clerks and 1 general worker.
2. Department of Dental Prosthetics, Head Dr. Miroslav SUVIN, (Senior Lecturer); Dr. Dragutin CUNDEKOVIĆ, Assistant; Dr. Lovro PAVELIĆ, Dental Physician; 6 clerical workers and 1 general worker.
3. Department of Dental Pathology; Head Dr. Zdenko NJEMIROVSKIJ, (Senior Lecturer); Dr. Milutin DOBRENIĆ, Assistant; Dr. Lovro PAVELIĆ, Dental Physician; 6 clerical workers and 1 general worker.
4. Department of Teeth and Jaw Regulation; Head Dr. Živko BOLF, (Senior Lecturer); Dr. Vladimir LAPTER, Assistant; 5 clerical workers and 2 general workers.
5. Department of Children's and Preventive Dental Medicine; at the moment of founding no teachers etc. (29) were named. In 1961 Dr. Oskar ŠTERN (23), (Senior Lecturer) was appointed Head of the Department.

However, a great mistake was made in 1959, when study was shortened from 12 to 8 semesters. Namely, study was shortened so that physics and chemistry were discontinued during the first year and some subjects were moved from higher to lower years. The programme quickly proved to have many drawbacks and thus teachers and students pressed

for reestablishment of a realistic method and duration of study.

During the school year 1960/61 a Vice-Dean for the study of dental medicine was appointed for the first time, Prof. Miroslav SUVIN (30), who taught the following subjects for several years: Introduction to Odontology (Dental Medicine) (II sem.), Dental Technology (IV sem.), Prosthetic Propedeutics (VI sem.) and Clinical Prosthetics (VIII, X, XI and XII sem). With his many years of teaching, research, medical and organisational work he left a memorable mark on the development of dental medicine. In 1961 the Department of Oral Diseases was founded at the School of Dental Medicine. The school year 1961/1963 was a turning point, when the teaching of dental medicine broke away from the Zagreb School of Medicine. Namely, after a decision of Parliament on 26 September 1962 the independent School of Dental Medicine University of Zagreb was founded.

The first Statute of the School emphasised the following: "Teaching and scientific work at the School will be performed in accordance with the concept that dental medicine is an integral part of medicine" Teaching lasted for five years (31). Prof. Živko BOLF was appointed the first Dean of the School, and with his many years of experience he contributed greatly to the successful development of the School. From that time the five-year study of dental medicine developed in accordance with a teaching plan and programme, which did not change significantly with regard to important provisions until 1994. As the basis of the scientific-teaching staff developed so also did the teaching content, and thus the School, apart from undergraduate teaching also very quickly began postgraduate study, specialist and permanent training.

The establishment of new School departments confirmed the introduction of new teaching content. Thus on the 8th February 1966, after a decision by the School Council, the Department of Dental Morphology was established (today the Department of Dental Anthropology), with Dr. Mustaf ĆATOVIĆ as Head and teacher. On 15th July 1971 the Department of Dental Prosthetics was divided into two departments, i.e. the Department of Removable Prosthetics was established with Dr. Danko NIKŠIĆ as Head, and the Department of Fixed Prosthetics, with Dr. Zvonimir KOSOVEL as Head. In 2000 they

were again united, and finally on the 19th April 1973 the Department of Periodontology separated from the Department of Oral Pathology, with Dr. Jelena AURER-KOŽELJ as Head.

Without doubt it was a period of great names in Croatian dental medicine. Prof. Miroslav SUVIN, Head of the Department of Dental Prosthetics, who for many years after retiring held postgraduate teaching in prosthetics at the School, and who became a legend of Croatian dental medicine. Prof. Oskar ŠTERN was Head of the Department of Children's and Preventive Dental Medicine. Prof. Vladimir LAPTER, Head of the Department of Orthodontics, also continued to work after retirement in 1989. He was the founder of specialist associations, Editor-in-Chief of the journal *Acta Stomatologica Croatica* and *Croatian Dental Herald* for many years. Prof. Milutin DOBRENIĆ, the first Head of the Department of Oral Pathology (today the Department of Oral Medicine), for several years after retirement actively participated in postgraduate teaching and permanent training. Prof. Zdenko NJEMIROVSKIJ, Head of the Department of Dental Pathology and Editor of *Acta Stomatologica Croatica* for several years.

Prof. Ivo MIŠE, Head of the Department of Oral Surgery, founder of Oral Surgery, founder of specialist associations and social worker. He was Dean of the School for several mandates.

Prof. Ivo ČUPAR, Head of the Department of Oral and Maxillofacial Surgery, (nester) maxillofacial surgery and founder of the same named Clinic. His major work, *Surgery of the Head and Neck* in three parts was printed after his retirement from 1973 to 1978, and was the basis of later development of the profession.

Their successors were also very important for the development of dental medicine teaching and the profession. Among them were Prof. Danko NIKŠIĆ, Prof. Zvonimir KOSOVEL, both prosthetists, who both died prematurely, at a time of maximum physical and mental ability. Prof. Vladimir AMŠEL, the second Head of the Department of Oral Surgery and one of the teachers working at the School since its foundation, as Dean of the School.

Prof. Branka PILAR-SVOBODA taught Maxillofacial Surgery at the School of Dental Medicine

and was one of the co-workers of the first publication on maxillofacial surgery.

Prof. Erih JELINEK, Head of the Department of Children's and Preventive Dental Medicine (today the Department of Pedodontics) also one of the teachers who worked at the School since its foundation in 1962. He headed the Department until retirement in 1980.

A legacy of the former period of study of dental medicine was a few negative points which were reflected in the quality of study. In the first place the dispersion of general medical teaching in several Zagreb hospitals. Because of this problem the Council of the School of Dental Medicine and the Council of the then General Hospital "Dr. Mladen Stojanović" agreed, at a joint meeting on 21st January 1971, that the hospital would fulfil all conditions for clinical teaching of students of the School of Dental Medicine, which had, in fact, already started on 8th June 1970. From that date today's University Hospital "Sestre milosrdnice" became the Clinical Hospital of the School of Dental Medicine University of Zagreb, which significantly alleviated the study of dental medicine.

Another drawback in teaching, which was felt for many years in so-called basic general medical subjects, and which had been impossible to solve until recently because of the rigidity of legal regulations and similar opinions of the Principals of both the School of Dental Medicine and the School of Medicine in Zagreb. The last few years have shown that in practice efforts for a direct business relationship of some of the teachers of basic subjects with the School of Dental Medicine was justified.

On 24 January 1992 the School opened new office premises at 34 Petrinja Street and the premises in Gundulić Street were renovated (32). By a decision of the town authorities rented office premises were made available of approximately 350 m<sup>2</sup>, which made it possible to move the whole of the School's administration to this new location, and the empty premises at Gundulić Street were renovated for the use of teachers. Thus, at last it was possible to ensure normal, academic working conditions for teachers with the appropriate auxiliary services. The premises have been renovated in which history and tradition of Croatian higher education can be discerned. Photo and video equipment has been acquired which can follow all forms of

teaching. Telecommunication has been set up for all clinical departments and lecture halls of the School, and the obsolete preclinical gymnasium has been renovated and equipped, which at last provides the means for excellent undergraduate teaching and the holding of courses on permanent training at the highest level.

During the last few years the School of Dental Medicine has entertained several guest professors from abroad Dr. Alexandra GUTOWSKOG from Germany, Prof. Zvonimir CURILOVIĆ, Croat and eminent teacher from Zurich (Switzerland), Prof. Dieter SCHLEGEL from Munich (Germany) Prof. Jolan BANOCZY from Budapest (Hungary) and Prof. Miomir CVEK, Croat who spent his working life teaching in Sweden (33).

The fact that such eminent names of world dental medicine agreed to be guests of professors from the School of Dental Medicine in Zagreb has great importance for the reputation of this school throughout Europe.

Postgraduate study, which has been organised at the School of Dental Medicine in Zagreb since 1973, offers the possibility of scientific improvement for the dentist. Since 1973 approximately 900 dentists have enrolled in scientific postgraduate study, and 352 defended their M.Sc. theses. From 1972 until 2002 170 Ph.D. theses were defended.

### Scientific research activity

In Croatia scientific research activity in dental medicine can be followed over one hundred years. Initially research was carried out by individuals, private physicians-dentists, who engaged in research work during their free time. Traces of such work have been preserved on the pages of Croatian journals (*Liječnički vjesnik*, *Folia stomatologica*) and abroad. Teachers of dental medicine at the University of Zagreb and other universities in Croatia had the right and obligation to perform research work. The foundation stone for research was laid by E. Radošević in 1922, the first teacher of dental medicine at the University of Zagreb, when he published his habilitation paper "Problems of Dentistry with Regard to Physical Chemistry". He was followed by I. Čupar, J. Kallay, J. Bocak, Jr., Ž. Bolf, M. Suvin and many others. With an increase in the number of



investigators in dental medicine the formation of a critical mass of workers made it possible to found the Centre for Interdisciplinary and Scientific Activity at the School of Dental Medicine in Zagreb in 1988. Over the last ten years the relevant associations for scientific work in Croatia, helped to financially support forty projects, and some workers from the School of Dental Medicine in Zagreb were co-investigators or principle investigators of projects which were partially financed by international institutions. A specific number of teachers at the School of Dental Medicine in Zagreb trained in well known centres in Europe, America and Asia. Active participation in scientific and professional congresses throughout the world offers investigators the chance to evaluate their own results, and to exchange ideas with foreign experts.

### The written word

Since 1933 Croatian dentists have contributed considerably to dental periodicals. For example, after the Congress of Dental Medicine in Crikvenica Dr. Juraj KALLAY took over editorship of the *Stomatološki glasnik*, the monthly journal of the Union of Dental Societies of Yugoslavia, which was published in Ljubljana (34). Juraj KALLAY edited two volumes of "*Paradentozna*" an occasional journal for research of periodontosis of the Society "ARPA YUGOSLAVIA" in 1935 and 1936 (35). In 1937 Dr. Ivo ČUPAR took over the editorship of the *Stomatološki glasnik* (36). Some office space was reserved in the Croatian Medical Club for the work of editorship. On his suggestion the journal changed its name to "*Folia Stomatologica*" with the object of being "with regard to scientific, professional and social class, at a level appropriate for a newspaper of our social class, important according to its number and the significance it should have for the people" (37).

"*Folia Stomatologica*" was published in Zagreb over the next four years. Two volumes were edited by Dr. Ivo ČUPAR (1937 and 1938) and two by Dr. Juraj KALLAY (1939 and 1940). "*Folia Stomatologica*" had an important role in spreading the written word of dental medicine. The role of the journal "*Folia Stomatologica*", which ceased to be published in 1950 was taken over by "*Acta Stoma-*

*tologica Croatica*", Editor Zdenko Njemirovskij, which was first published in 1966, from which year it has been continuously published. In 1993 the professional journal "*Croatian Dentistry Herald*" (*Hrvatski stomatološki vjesnik*) was first printed, and became the professional publication of the Croatian Dental Chamber. The periodical needs the addition of numerous teaching texts (scripts, manuals, and textbooks).

### Social organisation of the profession

The professional socialising of dentists in Croatia began in 1903, as the Society of Croatian Dentists, and its work can be followed up until 1914. On the 20th December 1903 Croatian physicians-dentists, members of the "Association of Physicians of Croatian and Slavonia" founded the "Society of Croatian Dentists" in Zagreb.

Guidelines for the work of the Society were as follows:

1. The task of the Society was to acquaint the public with oral hygiene by public lectures and publications "... a very important branch of general hygiene" and for its importance to be recognised in Croatian lands by the relevant authorities.
2. The production and sale of tested cosmetic preparations for the care of teeth and oral hygiene.
3. Free dental treatment for the poor, primarily poor schoolchildren. To this end the Council set aside part of the profits.
4. Only legally acknowledged doctors practising as physicians-dentists in Croatia, Slavonia, Istria and Bosnia & Herzegovina could become members of the Society (38).

On that occasion a scientific meeting was held. Dr. Žiga Hercog gave a report on the theme "Cosmetics for the Mouth", Dr. Eugen Rado analysed "Toothbrushes" (he was the author of toothbrushes patented in 1897), Dr. Adolf Müller asked "Is it necessary to use preparations which contain soap for care of the mouth?" and Edo Spitzer analysed the "Importance of cleaning the teeth". All lectures were based on knowledge from literature, individual experience, individual investigations and the co-operation of chemists, physicists, pharmacists and manufacturers. The critical attitude of the lecturers were contemporary and reflected important moni-

toring of the development of dental medicine as an equal medical branch and an important scientific discipline, in which progress could be achieved by the establishment of a laboratory "with all the necessary apparatus. As we cannot secure such apparatus ourselves it is hoped that our Society, which we have today founded, will succeed in doing so. Perhaps then Croatian dentists can enter the scientific arena and contribute something to the progress of the profession" (Ž. Hercog).

In order to procure money for realising the social programme they manufactured and recommended their own tested, scientifically assessed and assembled preparation for the care of the mouth and teeth under the name "Sanator". Profits from the sale of the preparation "Sanator" were presented to the Directors of public schools for free treatment of poor pupils. Members of the Society used their influence for the founding of school dental clinics (38).

In 1908 the Primorje Dental Association was founded in Rijeka (39), and in 1919, after the First World War, the Section for Dental Physicians was founded in Zagreb. The name was later changed to the Savska Banovina Dental Society (40) and in 1939 it again changed to the Croatian Dental Society (41).

In 1947, after the Second World War, the work of the Dental Section was renewed in co-operation with the Dental Clinic in Zagreb. The increase in the number of physicians-dentists encouraged the formation of branches of the Dental Section within the framework of the Croatian Medical Association (e.g. Rijeka, Split, Osijek, Čakovec, Karlovac, Gospić etc.) (15). The Croatian Dental Society of the Croatian Medical Association was the inaugural society of all later specialist societies. In 1992 it was accepted as a full member of the FDI and ERO. In 2003 the Croatian Dental Society will celebrate the hundredth anniversary of its foundation. During that period the number of dentists in Croatia has increased from ten in 1903 to 3300 practising in the Republic of Croatia today.

With the introduction of five specialisations in dental medicine since 1970 the need arose for basic specialist sections-associations. Orthodontists were first to establish a specialist section in 1966 - today the Croatian Orthodontic Society. Dental pros-

thetists established their section in 1972 - today the Croatian Society of Dental Prosthetists. In 1975 oral surgeons organised a professional society - today the Croatian Society of Oral Surgeons. In 1974 pedodontists also became professionally organised under the name the Society of Children's and Preventive Dental Medicine, and dental and oral pathologists and periodontists, followed by the Croatian Endodontic Society in 1993. The Society of Oral Medicine and Pathology of the Croatian Medical Association was established in 1997. The Croatian Periodontological Society in 1999 and the Croatian Society of Aesthetic Dental Medicine in 2000. The Croatian Society of Dental Traumatology was established in 1992, outside the framework of the Croatian Medical Association.

In 1995, on the basis of the Law on Health, and following a decision of the School of Dental Medicine in Zagreb and the Croatian Dental Society, the Croatian Dental Chamber was founded as an umbrella organisation for Croatian dentists.

## Conclusion

This review of the development of dental medicine in Croatia shows that it developed in a similar way to other European countries, and in accordance with the social and material conditions in the country. In the 20th century, in spite of the many setbacks in dental medicine in Croatia, dental medicine achieved European standards in some segments and professional work, through the work of physicians-specialists in dental medicine and dentists by preventive work at all levels of public and social work. The main emphasis up until the beginning of the productive activity of the Dental Clinic in Zagreb in 1939 was the importing of staff. After the foundation of the independent School of Dental Medicine in Zagreb in 1962 the structure of the staff for higher education in dental medicine in Croatia greatly improved, and the 1960s and 1970s saw an increase in the "export" of dentists to Europe (e.g. Federal Republic of Germany, Switzerland).

Unfortunately, today, we still cannot claim that there has been a significant decrease in dental caries and its consequences in the population of Croatia. We hope, however, that better days are ahead for dentists and their patients in Croatia.