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OLAF E. LANGLAND, D.D.S., M.S.

and

A. PETER FORTIER, B.S., D.D.S.

New Orleans, La.

Louisiana State University School of Dentistry

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Reprinted from

ORAL SURGERY, ORAL MEDICINE,  
ORAL PATHOLOGY

St. Louis

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Vol. 34, No. 4, pp. 680-689, October, 1972

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# C. Edmund Kells

*Olaf E. Langland, D.D.S., M.S.,\* and A. Peter Fortier, B.S., D.D.S.,\*\*  
New Orleans, La.*

LOUISIANA STATE UNIVERSITY SCHOOL OF DENTISTRY

The most prominent pioneer of dental radiology, Dr. Kells accounts for many important pages in the history of dentistry.

**C**harles Edmund Kells, Jr., D.D.S., F.A.C.D., L.L.D. (Fig. 1), was born in New Orleans, Louisiana, on Oct. 21, 1856, the son of Charles Edmund Kells, D.D.S., and Achsah (Cook) Kells, and died suddenly in his dental office in New Orleans on May 7, 1928. His death was one of the greatest tragedies in the history of dentistry.

His father was one of the leading dental practitioners in the South and was on the faculty of the New Orleans Dental College. Young Kells entered his father's office as a student in 1874, at the age of 18, and attended classes at the New Orleans Dental College. In 1876 he entered the New York College of Dentistry (now School of Dentistry, New York University) and graduated from that institution in 1878. While studying dentistry in New York, he was a frequent visitor to the Menlo Park Laboratory of Thomas A. Edison in New Jersey. Electricity always fascinated him. Returning home to New Orleans in 1878, he began the practice of dentistry in association with his father; this association was to last until 1896, the year that his father died.

Dr. Kells had been practicing dentistry for 18 years when, on Dec. 28, 1895, Wilhelm Conrad Roentgen announced his discovery of the x-ray. However, the news was not known on this side of the Atlantic until Jan. 6, 1896, when the discovery was cabled all over the world. Immediately, Dr. Kells realized the possibilities of the use of x-rays in dentistry and began an intensive study of these rays. With the help of Professor Brown Ayers, dean of the Scientific Department of Tulane University, he secured a Telsa coil and several Crookes' tubes.

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\*Professor and Head, Department of Oral Diagnosis/Medicine/Radiology; Active Member, American Academy of Dental Radiology.

\*\*Associate Professor, Director of Dental Radiology; Active Member, American Academy of Dental Radiology.



Fig. 1. Dr. C. Edmund Kells. (From Kells: *The Dentist's Own Book*, St. Louis, 1925, The C. V. Mosby Company.)

Although it is not documented in the dental literature, Dr. Kells most likely took the first intraoral radiograph on a living patient. Dr. Kells relates in his book, *Three Score Years and Nine*,<sup>1</sup> that he took the first intraoral radiograph on a *living* person (his dental assistant) in April or May of 1896. In order to accomplish this feat, he developed a film holder which would allow the patient to swallow during the exposure, for the exposure time was at least 15 minutes. He placed a thin board between the x-ray tube and the face of the patient for head stabilization. Unknowingly, he had thus used one of the first x-ray filters, which probably prevented radiation overexposure to the patient's skin.

Dr. Kells presented the world's first dental clinic with an x-ray apparatus. This clinic took place at the Southern Dental Association's twenty-seventh annual meeting in Asheville, North Carolina, on July 28, 29, and 30, 1896.<sup>2</sup> The meeting was held at the Battery Park Hotel, where electric current was supplied in the evening only. As Dr. Kells was presenting his now famous clinic, news spread throughout the hotel that a demonstration of the mysterious x-rays was being given by a dentist. Hotel guests swarmed into the clinic room. They all wanted to see the bones in their hands. The fluoroscope (fluorescent screen) proved invaluable at this demonstration. The members of the Southern Association were thoroughly impressed with the possibilities of x-rays in the practice of dentistry.

Dr. Kells also presented dental radiographs that he had taken on a living patient. They showed the perfect outlines of the roots of teeth. He stressed to his dental audience the importance of placing the film parallel, and as close as possible, to the teeth to prevent distortion in the finished radiograph. Dr.

Kells also demonstrated his film holder, which retained the film in the proper position during exposure. He thus advocated the right-angle or paralleling technique with a film holder as early as 1896, which preceded Weston Price<sup>3</sup> and Franklin McCormick.<sup>4</sup>

At various times in the dental literature Dr. William J. Morton has been credited with taking the first dental radiograph in the United States. This all stems from a lecture Dr. Morton gave before the New York Odontological Society on April 24, 1896. However, the radiographs that Dr. Morton presented at this meeting were intraoral radiographs taken on a dried skull, rather than on a living person.

Credit must be given to Dr. William Rollins,<sup>5</sup> of Massachusetts, who was experimenting with the use of x-rays in dentistry at the same time as Dr. Kells. He published a description of an intraoral cassette in a medical journal in July, 1896. However, it is documented in the literature that Dr. Kells was the first dentist to present a clinic in which dental radiographs taken on a live patient were shown.<sup>2</sup>

Ceaselessly, Dr. Kells worked to perfect this new technique of x-ray diagnosis. "I was like a hound dog on the trail of a rabbit," he used to chuckle, as he told of his experiments. Time and time again, every day for years, his hands were exposed to the x-rays. The early investigators did not know much about the dangers of x-rays, as we do now. They did not know that, coupled with the miraculous powers of "seeing through opaque objects," were the powers of destruction. They did not learn for years that constant exposure to x-rays had a cumulative effect that caused irreparable damage.

In the early days, the x-ray tubes constantly varied with respect to resistance and vacuum, and the tube had to be "set" for each individual case. This was done by taking a fluoroscope with the right hand, placing the left hand between the x-ray tube and the fluoroscope, and adjusting the rheostat until the bones of the hand showed clearly. The patient was then seated and the radiograph was exposed. This undoubtedly was one of the contributing factors which were to cause irreparable damage to Dr. Kells' left hand later in his life.

In Kells' day, the taking of the x-ray picture was an event. A special appointment was made for an evening session at his residence. The usual preparations and the actual taking and processing of the radiograph consumed the entire evening. It took from 5 to 15 minutes to expose the film and 30 to 60 minutes to process it.

In due time, Dr. Kells was to pay the penalty for his pioneering work in the unknown world of x-rays. In 1908, just 12 years after he began his x-ray experiments, he noticed a lesion on his left thumb which did not respond to treatment. Presently other lesions appeared on the same hand and would not heal. The only treatment was to amputate the finger at the joint in order to keep the lesion from spreading. Dr. Kells went to Johns Hopkins University in Baltimore some thirty times for amputations. He kept on practicing dentistry. He invented dental instruments with attachments so that he could use them with what was left of the fingers and thumb of his left hand. Finally, the surgeons at Johns Hopkins told him that they must take off his left hand. Dr.

Kells' face whitened. "A one-armed dentist!" But it was too late to stop the progress of the results of those previous x-ray exposures. In his thirty-fifth operation in 1926, surgeons removed his left arm at the shoulder.

The amputations were by no means the worst of the sufferings that he had to endure. For 20 years Dr. Kells did not know a day without pain—pain from skin grafting, pain from radium treatment, pain from ultraviolet light treatment, postoperative pain, and pain from new lesions forming.

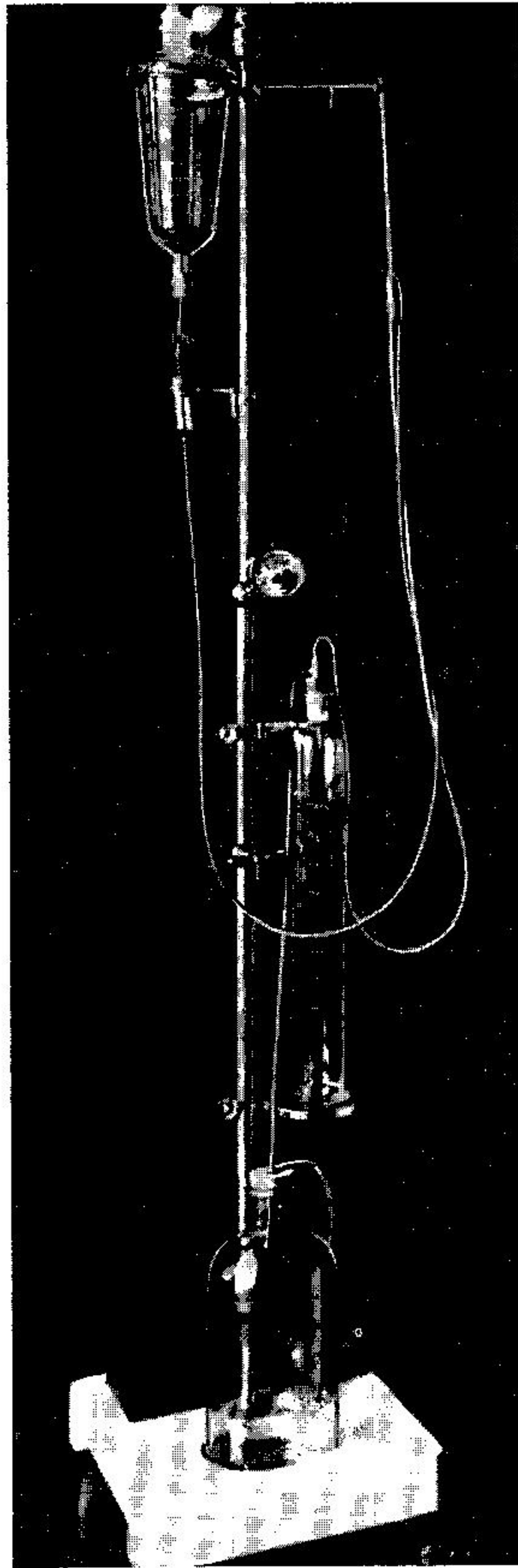
Through it all, he worked as no other man has worked. He completed countless inventions and patented more than thirty of them. His inventions included an electric thermostat, a fire extinguisher and alarm, an electromagnetic clock, an automobile starter, a sanitary faucet, and a drinking fountain. He made the first dental stereoscopic radiograph, was the first to introduce the diagnostic wire to the field of endodontics, and was the first to send a dental radiograph by phototelegraphy.

One of his inventions, which won him worldwide fame among dentists, physicians, and surgeons, was a suction apparatus for the aspiration of fluids and the irrigation of cavities in the human body during surgical operations<sup>6</sup> (Fig. 2). This replaced the old technique of mopping the surface with surgical sponges. Dr. Rudolph Matas of New Orleans, one of the world's most distinguished surgeons and a contemporary of Kells, said: "The suction apparatus is sufficient to immortalize the name of Dr. C. Edmund Kells. It has won the eternal gratitude of every working surgeon in the world."

Kells' contributions to the scientific dental literature have been enormous. He was the author of two textbooks, *The Dentist's Own Book* and *Three Score Years and Nine*. He wrote three chapters of Johnson's *Textbook of Operative Dentistry*, a standard textbook in its day. He contributed more than 200 articles to the literature of dentistry, covering every phase of dentistry.

Kells never hesitated to express his opinions on any subject related to dentistry, and he was an able debator in the defense of his convictions. In defending his belief, however, he had an open mind and a strong belief in his profession. His simple, colloquial style of writing, filled with human emotions, strongly appealed to the practicing dentist. Kells' writings were conservative in nature, but most often he kept ahead of the times. He was brave beyond belief. Through 20 years of untold suffering, he preserved the perfect poise of good cheer. In his writings there was not a hint of the terrible tragedy that had befallen him.

In 1911 an English physician, William Hunter, read a paper before the Faculty of Medicine of McGill University in Montreal, publicly accusing "American Dentistry" of contributing to the ill health of its people. The physicians of the United States responded almost immediately to Dr. Hunter's advice. People, young and old, had their teeth extracted on prescription of their physicians—in most instances without any improvement in their health. While dentists across the states were in the business of wholesale extraction of good pulpless teeth,<sup>7</sup> Kells advocated the management of tooth abscesses with root canal therapy. He used the radiograph to the fullest extent in examining his treatment of pulpless teeth. Kells won his fight to prevent wholesale extraction



*Fig. 2.* Aspirating and irrigating machine. (From Kells: *Three Score Years and Nine*, New Orleans, 1926, private press, p. 101.)

of pulpless teeth. He lived to see his stand acknowledged as right by his own profession.

During the last 20 years of Dr. Kells' life, he was winning his fight for "better dentistry." In the meantime, however, he was slowly losing his fight



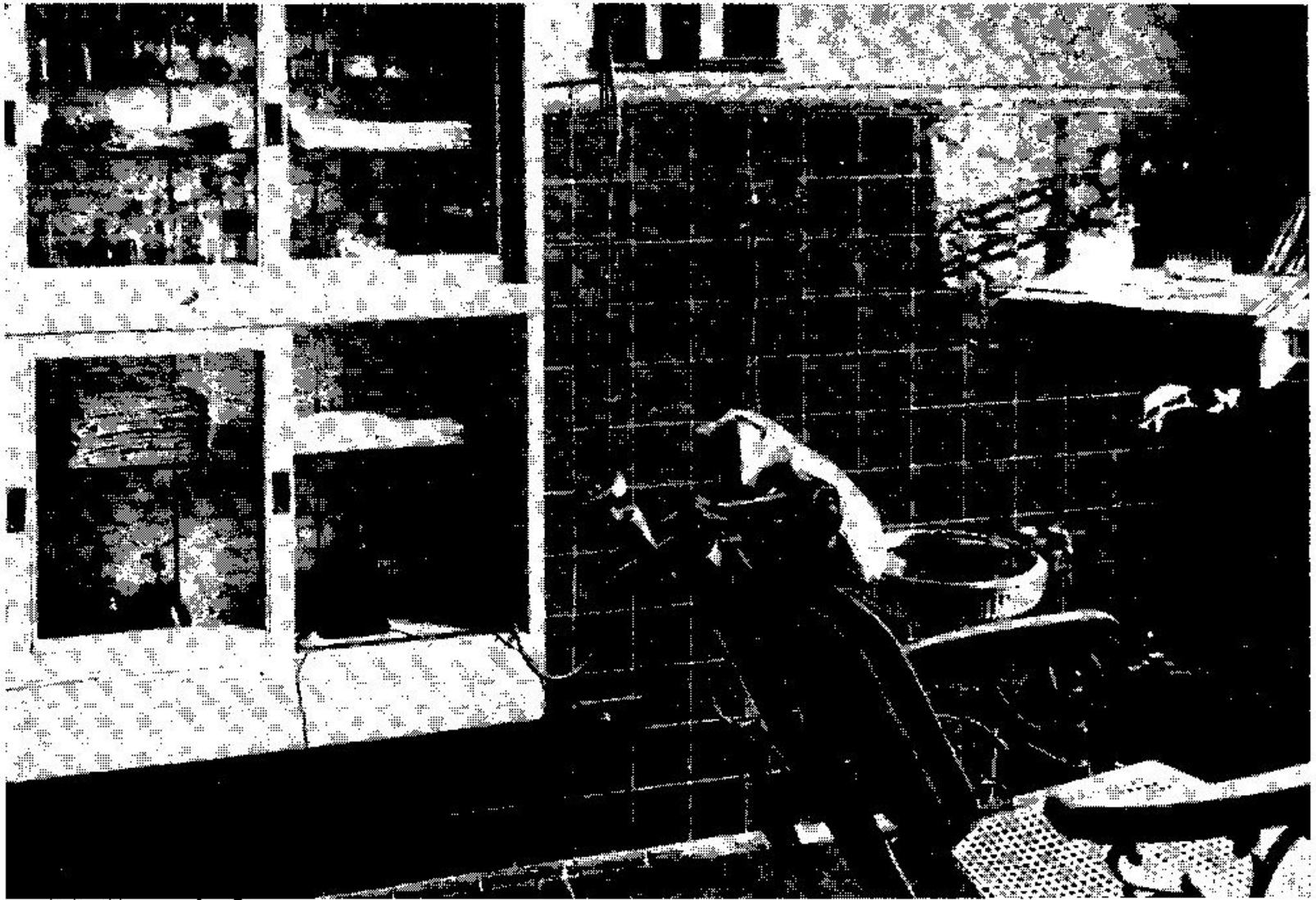
*Fig. 3.* Dr. Major B. Varnado presenting an original paper of his beloved Dr. Kells at the third annual meeting of the Eastern Dental Radiology Workshop in New Orleans, La., June, 1971.

against epidermoid carcinomas of his arms and hands.<sup>8</sup> In 1919 "Eddie" Kells, as he was affectionately called by his personal friends, gave up general dentistry and limited his practice to dental x-ray diagnosis and minor oral surgery. This was a sad time in Dr. Kells' life, but he endured it without complaint, for he was the highest type of professional man.

The highest honor which Tulane University can bestow was tendered to Dr. Kells on Jan. 19, 1927, when the University conferred upon him the degree of Doctor of Laws. This placed him in a small group, which at that time included Past-President Woodrow Wilson, Marconi, and Marshal Foch.

The New Orleans medical and dental professions added their recognition by the dedication of the C. Edmund Kells Memorial Library and Museum at Tulane University. This library no longer exists, but a portion of Dr. Kells' original collection is now on display at the Smithsonian Museum in Washington D. C. Plans are now under way to transfer the remainder of Dr. Kells' library collection from the archives of Tulane University to the new dental library at the Louisiana State University School of Dentistry.

Dr. Kells was a true soldier of science, and he looked the part. He had a slim,



*Fig. 4.* Dr. Kells' dental operatory in 1925. Note the wall-mounted bracket table, a suction machine in the cabinet, and no evidence of a dental unit.

erect, military figure, white hair and moustache, and keen blue eyes. His empty left sleeve was pinned up like that of a soldier. The empty sleeve represented as much a decoration of valor as any medal bestowed on the field of battle. By now his right hand had become afflicted with epidermoid carcinomas, and the skin grafts and the amputations of fingers began all over again.

Dr. Kells wrote his last article in a New York hospital shortly before his death.<sup>9</sup> It gives the reader a clear insight into Kells' philosophy of life during that period. In the article, Kells stated: "Do I murmur at the rough deal the fates have dealt me? No, I can't do that. When I think of the thousands of suffering patients who are benefited every day by the use of x-rays, I cannot complain. That a few should suffer for the benefit of the millions is a law of nature. And now the clock in the steeple, not afar, strikes two, I will close my dear little Red Book, and with the faces of all dear friends fading away, I'll soon be in slumberland. Good night, dear boys, good night."

During this same period, Kells was working diligently to finish his third book, *Conservation of Natural Teeth*. Most of the manuscript was dictated to his secretary, for by now his right hand was just a group of maimed stumps.

The intensity of pain during this period must have made it very difficult for him to think coherently. He refused to take narcotics. His eyesight was failing him. Yet he finished the manuscript of his third book almost the same day that he died.<sup>10</sup> The manuscript was never published. He must have known that the end of his work on earth was near. He dreaded, more than most men,



*Fig. 5.* Dr. Varnado holding tube head of Dr. Kells' original Victor CDX (1925 model). This photograph was taken in June, 1971, in Dr. Varnado's dental operatory, which is Dr. Kells' original office.

the prospect of being a helpless burden on those he loved. Always a conqueror, Eddie Kells could not endure such a humiliating defeat. He was 72 years of age. His work was done. On May 7, 1928, at 2 P.M., proud of spirit, he became the master of his own destiny. He placed a bullet into the brain that had done so much to help suffering humanity through the application of electricity and x-rays. The stump of his thumb was enough to pull the trigger. Pain in this world was over for C. Edmund Kells.

Those who knew Dr. Eddie Kells intimately in no way considered his act of suicide an act of cowardice. For 20 years he had suffered pain such as few human beings ever know. Few people, knowing the truth, can find it in their hearts to say that his last act of life on earth represented anything but the highest courage and the deepest consideration of others.

The words of the great C. N. Johnson probably sum up Dr. Kells' life better than anyone else: "We admired his brain power, his genius, his intuition, his versatility with all of which he was abundantly blessed; but best of all was the heart of him—his great, luminous and loyal heart that never beat an unworthy stroke in all his 72 years."

After 121 years, the dental practice that was started by Dr. Charles E.



Fig. 6. Dr. Kells' working unit (1925). (From Kells: *The Dentist's Own Book*, St. Louis, 1925, The C. V. Mosby Company, p. 299.)

Kells, Sr. (1850) and continued by Dr. C. Edmund Kells, Jr., and Dr. M. B. Varnado, came to an end in July, 1971, with the death of Dr. Varnado at the age of 89. Dr. Kells, Jr. became associated with his father in 1878 and practiced until May, 1928. Dr. Varnado started with Dr. Kells, Jr., in 1918 and practiced until July, 1971. Dr. Varnado practiced in the same office on the twelfth floor of the Maison Blanche Building on Canal Street in New Orleans for 53 years. This was the office which Kells designed and first occupied in 1907.

In June, 1971, New Orleans and the Louisiana State University School of Dentistry hosted the third annual Eastern Dental Radiology Workshop. This workshop was dedicated to Dr. C. Edmund Kells, Jr., and Dr. Major B. Varnado was one of the main speakers on the program. Dr. Varnado read a paper on the life and works of Kells (Fig. 3). That same afternoon the participants of the Workshop visited Dr. Kells' office where Dr. Varnado was still practicing (Fig. 4). They were fascinated with Kells' original equipment and furniture, which were still in use, especially Dr. Kells' original Victor x-ray unit (Fig. 5). This office still has direct current. It was wired originally by Dr. Kells in 1907, when the Maison Blanche Building was constructed.

One of Dr. Kells' dental assistants, Mrs. Malvina Cueria, is still living in New Orleans. She has many fond memories of her association with Dr. Kells. When we speak of utilization of dental auxiliaries, we should note that Kells started employing female dental assistants in his office in 1885. He had at least two to five dental assistants throughout almost all of his days as a practicing dentist (Fig. 6).

We are approaching the end of an era in dentistry. Dr. C. Edmund Kells and Dr. Major B. Varnado of New Orleans, Louisiana, represented the "good old days of dentistry." Everything in those days was done with a special charm. This was the time when a person went to his family dentist for every kind of dental work; patients in those days would have changed their religion more readily than they would their family dentist or physician. Dr. Kells and Dr. Varnado were more than merely great dentists; they were important figures in the great history of dentistry.

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*Reprint requests to:*

Dr. Olaf E. Langland  
Department of Oral Diagnosis/Medicine/Radiology  
Louisiana State University School of Dentistry  
1100 Florida Ave.  
New Orleans, La. 70019