

DENTAL HISTORIAN

THE NORTH OF ENGLAND
DENTAL CO^Y
PRIZE MEDAL TEETH
THESE TEETH

2/6



2/6

STOCKTON 57 HIGH STREET
DURHAM 69 NORTH ROAD
SPENNYMOOR 38 HIGH STREET
BISHOP AUCKLAND 10 SOUTH ROAD
SOUTH SHIELDS 18 MARKET PLACE

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DENTAL HISTORIAN

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LINDSAY SOCIETY FOR THE HISTORY OF DENTISTRY

OFFICERS (2010-2011)

Chairman	Dr Stuart Robson	stuartrobson367@btinternet.com
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Editor of Dental Historian	Prof Stanley Gelbier	sgelbier@yahoo.co.uk
Committee	Drs Ian McIntyre (died 8 May 2011) Mary McFarlane and Stuart Geddes	

Membership eligibility

In Britain: members of the British Dental Association, dental students and other interested persons not dentally qualified. Overseas: all dental practitioners and other interested persons not dentally qualified. Membership applications should be sent to the Honorary Secretary, Dr Brian Williams, 14 Howard Road, Great Bookham, Surrey, KT23 4PW.

Subscriptions

£25 (£30 for overseas members) per annum payable in sterling in October to Dr P Frost, Hon Treasurer, 178 Peckham Rye, London, SE22 9QA. Free to student members of the BDA.

Dental Historian

Persons wishing to submit papers for publication (ideally as an email attachment or on disc) should send them to sgelbier@yahoo.co.uk or Prof S Gelbier, editor *Dental Historian*, Unit for the History of Dentistry, KCL Dental Institute, Floor 18, Tower Wing Guy's Hospital London SE1 9RT. *Dental Historian* is sent free to members. Non-members wishing to purchase a single issue can do so by sending a cheque for £12 sterling (+postage and packing for overseas addresses) made out to the Lindsay Society for the History of Dentistry to the Distribution Manager, Dr G Gamett, Hey Bam, Back Lane, Newton-in-Bowland, Clitheroe, Lancs, BB7 3EE.

EDITORIAL

This issue again covers a wide range of subjects. There are papers about three dental schools, dentistry in Ancient Egypt, a 19th century Maltese dentist, an Argentinian dental personality and the Forensic identification of Adolf Hitler and Eva Braun. Also reports from the Lindsay Society and the Henry Noble Research Group plus feedback from a meeting in France to celebrate the life of Pierre Fauchard (1678-1761).

We were sad to learn of the death on 8 May 2011 of Air Vice Marshall Ian McIntyre, committee member of the Lindsay Society. He was formerly chief executive (ie chief dental officer) of the UK Defence Dental Agency.

COVER ILLUSTRATION: NORTH OF ENGLAND DENTAL CALENDAR

Rachel Bairsto*

This calendar was produced by the North of England Dental Company in 1888 to advertise the dental treatments available at various times and locations across the region. In particular the company was proud to advertise its Prize Medal Teeth, which could be: "adapted to the mouth without pain and for a natural appearance, comfort and strength these teeth cannot be excelled."

Despite searching trade directories and the Register of Chemists and Druggists and Dentists Registers we have been unable to uncover any information about the occupiers of the listed addresses.

The BDA Museum would like to thank member Chris Bee for the generous donation of this calendar.

HONOUR FOR DR XAVIER RIAUD

Congratulations to Dr Riaud, the well known researcher on dental history. On 21 March 2011 he was promoted to Knight of the Academic Palms for his historical work. The Academic Palms is one of the three most important French distinctions. The other two are the Legion of Honour and the National Order of Merit. Created in 1808 by Napoleon the Academic Palms is a distinction given to people who teach in school or university, for their research. He was rewarded for his historical work, articles and books. These distinguished people have to defend the French language in France and in others countries, which clearly Dr Riaud does.

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THE ROYAL DENTAL HOSPITAL OF MELBOURNE

Henry Atkinson * +

The Odontological Society of Victoria and the Dentists Act 1887

The romance of the Royal Dental Hospital of Melbourne commenced with the establishment of the Port Philip Settlement in Australia and its later declaration in 1886 as the Colony of Victoria. By this time the city of Melbourne was well established and expanding. The street directory of 1857 lists the names of nine dentists who were practising in an area where professional regulation was as yet unknown: anyone could claim to be a dentist and practise. The often disastrous results of a free for all situation and the need for recognition of their previous status influenced some local dentists to meet and discuss the problems. As a result they formed the Odontological Society of Victoria in 1884 on the lines of a similar organisation in England¹ of which they would have been familiar. After three years of hard work, including the persistent lobbying of members of the local government and the submitting of petitions, the result was the passing in 1887 of the first dental act for the regulation of the practice of dentistry. This came nine years after a similar act in Britain. The 1887 Act required the establishment of a recognised institution for the education of future dentists. It spurred the committee to consider the setting up of a hospital for the treatment of the deserving poor and the training of dentists, but after some debate the society abandoned that project.

Undeterred the president of the society, Mr John Iliffe (Fig 1), who was a strong protagonist for a hospital, called a meeting of all local dentists for the purpose of discussing the formation of a hospital. As a result the Dental Association of Victoria came into being with the twin aims of starting a hospital and watching over the interests of its members.

Before a large gathering of important citizens and with due ceremony The Melbourne Dental Hospital was opened in November 1890 in rooms over Garton's Horse and Carriage Bazaar in Lonsdale Street opposite the Melbourne Hospital, the main general hospital in the colony. Under the guiding hands of Iliffe and his colleagues the hospital went from strength to strength taking on apprentices and organising teaching programmes. The annual report showed the good work done.

Unfortunately the colony was soon to suffer from a series of political disasters, the collapse of the land boom, financial problems, gold rushes that

denuded Melbourne of male workers and strikes all of which affected the working of the hospital. At committee meetings when the problems were acute only the president John Iliffe and the secretary Mr E Joske were present. For Iliffe the collapse of the hospital was the end of a dream, the loss of all the effort and work that had been directed to establishing a hospital and forming a stable profession and then the return to the chaos of the early years. However with characteristic determination he influenced colleagues to attend a public meeting at which the proposal would be put that in order for the hospital to continue as a public institution its administration be taken over by the Dental Association of Victoria, the original founder; a move that was successful.

Figure 1 Mr John Iliffe (1847-1914) founder of the Melbourne Dental Hospital and the Australian College of Dentistry, c.1890s



The Australian College of Dentistry

Shortly after this change a further meeting of dentists was called to consider the establishing of a different type of educational institution for the more basic training of dentists. The resultant Australian College of Dentistry opened in 1897 and with out any formal proceedings took the hospital under its wing. (Fig 2) It is essential to point out that in a small community which the city of Melbourne then was the same willing workers appeared on the Dental Board, the committees of hospital, association and now the Australian College of Dentistry. But mainly through the drive

and character of Iliffe the various groups continued to function during their formative years.

There was some justification therefore for the criticism that a small elitist group was taking over control of the profession. However it was made clear that the Board was a statutory organisation whilst the college and hospital were private ones. Although occupying the same building the former was managed by a Council and the latter by a Committee. The accounts and the raising of funds by the two bodies were also, in theory, separate exercises; the college by student and apprentice fees and the hospital by donations from industry, contributors, (people who paid an annual sum to the hospital for the privilege of the right to vote at annual meetings) and small sums from patients' fees – but in practice the coffers were common.

At that time many patients preferred an extraction without a local anaesthetic as the after-effects of the injection were painful and long lasting. Consequently when a student extracted a tooth without using a local no charge was made. The operation was referred to officially as 'pure and simple'. However the students preferred the expression 'cold steel' as being more appropriate; fillings and other treatments attracted small but very useful fees.

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¹ The Odontological Society of Great Britain, 1863 (founded originally as the Odontological Society of London, 1860).

Requests for support by the government and organised charities were unsuccessful. With the advent of the college and of formally structured courses there was certain regularity in receipts but funds were never sufficient to meet

Figure 2 The Dental Hospital at 239 Lonsdale Street Melbourne. The addition of the small board reading 'COLLEGE' would indicate a date late in 1897



the requirements of the expanding institutions. After being established for a few years and demonstrated it was a stable academic body the College was accepted by the University of Melbourne as "one of and within the University". As a result a Faculty of Dental Surgery (later Science) was formed which increased public confusion over management as then there were four different bodies with similar memberships and the same secretary, three of which occupied the same building! However the institutions prospered, each gaining kudos from the others. The need for acquiring larger premises or a possible move to the university campus for a new building were debated. It resulted in the decision by both college and hospital to construct a common building. Approaches to government for support were negative but in the reply a rider was added that

when the administration of the hospital and college were completely separate a request might be considered.

A new building

The college proceeded with the development of plans for a building that included the hospital. Under Iliffe's guidance, individual members provided security, a bank loan was obtained, land purchased and a building constructed. It was entered in 1907 with the hospital as a tenant of the college, so the cosy relationships continued (Fig 3). The new facilities contained an area for extractions divided into "gas" and "locals", a large conservative dental surgery with some thirty dental chairs of a simple manually operated type with spittoons attached; a large dental mechanics laboratory with associated small impression room. The large waiting area appears to have doubled for an 'examination room' where after a brief inspection in full public view a patient would be directed to the appropriate department. The general anaesthetic surgery was under the supervision of a visiting medical anaesthetist with the hospital superintendent as assistant. The latter was also responsible for teaching in other areas. In the large mechanical laboratory hospital mechanics prepared

dentures for hospital patients working along side dental students the whole being supervised by the senior mechanic who also taught students. The impression room was supervised by a visiting dentist. The conservative clinic was vast and would have had two or three visiting dentists present at any one session as regulation (orthodontics), root fillings, inlays, crowns and bridges were all taught there. It was the responsibility of the student to clean and empty the spittoon after each patient, a task frequently neglected! Later, as funds became available, row by row, mains services were supplied to the chairs. Due to the scarcity of finance and the attitude which developed in the profession over the years of apparently distancing itself from "mechanical dentistry", the impression room (renamed prothetic clinic in 1924) was still unserved in 1963 when the premises were vacated for the "new building".

Figure 3 Sketch of college and hospital building on Spring Street Melbourne 1907. Note trooper on horse back



THE NEW MELBOURNE DENTAL HOSPITAL AND THE AUSTRALIAN COLLEGE OF DENTISTRY.

The Great War caused massive disruptions to the functioning of the organisations with staff and students volunteering for service in all branches of the armed forces. On cessation of hostilities and a return to more normal life there was agitation by staff and students for improvements in accommodation and teaching. It saw in 1924 the appointment of Dr F C Wilkinson (Fig 4) of Liverpool, England as the first professor of dental science. He had an

immediate effect on the running of both institutions. Wilkinson modernised the various services and courses, appointed a lecturer in dental prosthetics and separated the teaching of dental mechanics from hospital influence, moving it to a different laboratory. A new special hospital surgery was installed with the latest equipment for the treatment of patients requiring oral or periodontal surgery, which was also supported by a laboratory with appropriate research facilities. As principal of the college and dean of the faculty Wilkinson had direct control over teaching but not all clinical facilities. Therefore, as an ordinary member of the hospital committee, he had to present a very sound case to gain support for any changes to clinical areas for improving teaching. Many members of the committee saw each of his advances as a loss of control of their hospital. However his insistence on changes including the abandoning of student apprenticeships together with the separation of the finances of the institutions into two entirely different accounts resulted in the hospital's next application for funds to the government being successful.

Figure 4 Professor Frank Clare Wilkinson (1889-1979), Foundation Professor of Dental Science at the University of Melbourne, Dean of the Faculty of Dental Science and Director of the Dental Research Department, c.1933



The depression years were commencing and the hospital was virtually bankrupt. It did everything possible to raise funds such as taking part in street collections, canvassing businesses, industry and the unions for assistance. Some relief came when it was learned that in America mothers clubs were collecting scrap amalgam and selling it giving the funds to the colleges. The wives of council and committee members commenced a similar arrangement in Melbourne. It resulted in a formal hospital auxiliary being established, remaining in operation until the early years of the 21st century. It gave considerable sums to support primarily the hospital but also student scholarships and occasional faculty

projects when they involved clinical matters

Separation of facilities, changes in teaching methods and an increase in length of the course resulted in demands for more services and space for clinical teaching. It again saw a recommendation come forward for a move to a new building on the campus for the college, with the hospital accommodated in the Melbourne Hospital which had moved to a new site opposite the university. Some support was obtained and sketch plans drawn. However as Wilkinson retired in 1934 and funds were again even more scarce the proposal lapsed.

A new professor

Dr A B P (later Sir Arthur) Amies, a Melbourne dental graduate with a medical qualification, was appointed to the chair in 1934. But with the move to the campus having lapsed a new area for a school and hospital was found on the Haymarket site. At that time the government agreed to build a new dental school and hospital without charge to the college provided that, in exchange, it transferred the present land and building, free of all incumbrances to the government. In spite of the separation of the administration of college and hospital engineered by Wilkinson the college now moved into the affairs of the hospital, establishing a joint building committee with the principal as chair. Subtle changes in membership of the hospital committee occurred with the astonishing suggestion that the professor be made the chief executive officer of the hospital. This was met with some opposition but succeeded when later changed to the dean of the hospital, with control of all staff.

The appointment as dean of the hospital caused considerable friction within that body. Both the superintendent and the secretary complained to the committee of being unable to run an efficient institution because of his constant interference. As they received no support both resigned. Meanwhile planning continued under difficulties as funds were only available on an irregular basis. Also the government was totally opposed to some of the suggestions of the joint building committee. The main one was the inclusion of a 24-bed ward as there was a major hospital opposite with all the necessary facilities. However before the plans for the whole building were completed or funds guaranteed a contract was let for construction to the level of 'the ground floor slab'. Shortly after, in 1956, without any further progress on plans or promise of funds, the ceremony of the laying of the foundation stone of what mounted to a phantom building took place. At this stage in the saga of the new building the government took an active interest in the affairs of the hospital by appointing new, non-dental, members to the committee of management. It then reorganised the joint building committee with a new chairman and members with business, engineering and building experience so that within the next five years, in spite of minor delays, all planning was completed, a new contract let for completion and the building finished, but without a ward. It was entered with due ceremony in May 1963.

Shortly after its reorganisation the committee of management decided there would be no more deans of the hospital. As the present incumbent was close to retirement he was allowed to continue in an honorary capacity. In accordance with earlier agreements the University of Melbourne took over the academic activities of the college, giving all its teaching responsibilities to the faculty of dental science which now worked directly with the hospital over the administration of clinical matters.

A major interruption in the life of the hospital occurred almost immediately after entry to the new building. The faculty announced a reduction of the quota of first year dental students by almost one half as the promised increase in academic staff had not been met. The new building could accommodate approximately twice the number of existing students. As the first two years of the course did not involve clinical teaching it was agreed, some three years before the building would be completed, that provided staff were available

increases in the quota could be made. The proposed reduction was well known in university circles but when it became public that a modern brand new school and hospital was reducing its output of dentists and consequently the number of patients treated, government action was swift. The Minister for Health intervened and set up a committee with representatives from the total dental scene in Victoria to examine and report on the situation and how the affairs of the hospital were affected. This action temporarily strained the relations between the hospital and faculty but before the report was made public changes were occurring and long-term benefits came to the community at large, the hospital and the faculty.

The current situation

Over the succeeding years the hospital services have continued to expand with the establishment of clinics in country general hospitals throughout the State. New dental acts from 1972 onwards increased the powers of the dental board, recognised school dental therapists, advanced dental technicians (now prosthetists) and also specialisation in dentistry. Legislative changes continue. Today, as a major public hospital the, Royal Dental Hospital of Melbourne is the centre of the dental health services of Victoria. It provides first class clinical facilities for the Dental School of the University of Melbourne.

On 26 June 1969 the title 'Royal' was bestowed on the hospital.

Acknowledgements

All images are from the Henry Forman Atkinson Dental Museum, University of Melbourne.

POST OFFICE AT THE MELBOURNE DENTAL HOSPITAL (Editor's note)

When he heard the journal was to carry an article on the Royal Dental Hospital of Melbourne, dentist-philatelist Dr Stuart Geddes, national director for BDS Wales, drew the Editor's attention to two interesting facts. First, the Melbourne Hospital site had its own post office and envelope frank (Fig 1), one of few hospitals world-wide to do so: none were dental. In the UK were the Edinburgh Royal Infirmary (since closed) and the Orthopaedic Hospital in Oswestry. Secondly, in 1990 the Australian postal system issued a postal stationery item showing a dentist in a clinic in the hospital with an imprinted 43 cents stamp on the envelope showing a radiograph. (Fig 2).

Figure 1 An envelope franked as from the Royal Melbourne Hospital (on the same site as the Dental Hospital)



Figure 2 Centenary cover and stamp



The Figures are from Dr Geddes' collection.

GUY'S HOSPITAL DENTAL COURSE (1944-1950) SOME THOUGHTS FROM AN EX-STUDENT

W A Barry Brown

Introduction

The declaration of the Second World War in 1939 had a major influence on my choice of career. By 1943, the year I sat my School Certificate examinations, my contemporaries and I were faced with being called up into one of the armed services. Several wanted to be fighter pilots and I wondered at their fearlessness. I dreaded the prospect of being a soldier, quite apart from the disagreeable imagining of being wounded or killed by the Germans. I was horrified by the thought of having to fire at and kill my fellow humans. My mother had unfolded the grim horror of the First World, when she was a nurse in a casualty station just behind the front line. She gave vivid descriptions of the terrible injuries inflicted and sufferings of young soldiers hit by shrapnel or bullets from rifles or machine guns. Even when not fighting they suffered appalling day-to-day conditions. She had unwittingly inculcated within me a dread of military combat. What was I to do? Among my earliest memories were my mother saying that one day my brother and I would become doctors or dentists. Later my father, a dentist in the army, said that only professional people survived in a severe economic crisis. My brother always wanted to be a doctor, but I didn't. At that time there was no question of doing an ordinary university degree. Entry into all degree courses, except for medicine and dentistry, was delayed until after the war. My parents had always assumed I would become a doctor or a dentist. By 1944, my father was a senior administrative officer in the Royal Army Dental Corps so I thought I would get a dental degree and quickly escape the repetitive details of clinical practice. I'd become an organisation man like my dad!

I used a subterfuge to disguise my abhorrence and fear of the dangers of war. I did think of being a Conscientious Objector, but I couldn't in all honesty do that. I understood from the earliest months of the war that Hitler and the Gestapo were an evil against civilisation. And I knew about anti-Semitism from the Jewish refugees to whom my mother offered hospitality at Sunday lunches. The war against Hitler was a war that had to be fought.

I applied to and was interviewed at Guy's Hospital Dental School by the very old looking Bocquet Bull, the dean. He only asked me what sports I played and why I applied to Guy's. When I said my mother had trained as a nurse at Guy's in 1910 there were no other questions.

The preclinical course

I joined the dental course for its first year of basic science. Though I had already done a year in biology, physics and chemistry at my boarding school, I found the unfamiliar teaching style at Guy's with packed lecture theatres difficult to follow, and was totally unable to work on my own. The teachers of these subjects were successful academics with their own original published work. Grey haired Professor Stead who taught physics lectured in a dark city suit. He had worked with or knew Rutherford whose pioneer work in nuclear physics contributed the design of the atomic bomb. Intriguingly, months before the dropping of the first atomic bomb on Hiroshima, Stead remarked as an aside one day that the prospect of splitting the atom and developing an atomic bomb were a real possibility.

Mr Baxter taught biology in an accessible way. Mr Ewing taught us chemistry and memorably pronounced mother liquor as 'mudder licker'. A year later, when I was living in Fulham, I often travelled on the same District underground train as he did, but we never spoke. Tragically he threw himself under an approaching train, and the first anyone at Guy's knew of his death was when his unidentified body was recognised in the Guy's Hospital mortuary. With such undoubtedly talented teachers, I cannot understand why or how I frittered away the time, but ended my first year hopelessly failing my 1st BDS examinations. I was lucky not to be thrown out and was transferred to the LDS course regulated by the Royal College of Surgeons of England.

I was overwhelmed by my failures, believing that I must be a very stupid person. It took me some time to recover my confidence. I passed the College's physics and elementary biology exams in December 1945 and chemistry in June 1946. The last was delayed because it included organic chemistry, for which I had to attend special classes. I quickly absorbed the new subject, taught by Dr Brain. He greatly restored my confidence when he gave me a high mark in the term test, laughingly saying he must have been asleep when he marked my paper.

Accommodation

My first digs in London were in a Victorian house in Blackheath with five medical students and a Polish engineer, Tchaikovsky, who became a very good friend. Among the medical students, Owen was a Welshman, an enthusiastic fly fisherman who relaxed at the weekends by making his own flies. Pearce was from King's School, Canterbury, a very assured character with a blustering manner, who worked very hard. There was a very clever boyish looking student who had been at Bedford Public School. There were two much older students whose particular lifestyle implied a sophistication at which I could only guess. They were unbelievably confident as if they knew how lucky the medical profession was to have them as recruits. A motherly Mrs Prior supervised the establishment. Blackheath was on the path of

doodlebugs, V1 bombs, on their way to Central London. Occasionally they landed and exploded nearby, causing extensive and widespread damage. I often heard their noisy motorbike-sounding engines. If you could hear them overhead, you were safe; but their engines cut out before reaching, you were at risk. V2 rockets followed later. Also omnipresent were our defences, the rapid firing rockets anti aircraft guns located on the Heath, whose shrapnel fell with a clatter on the neighbouring roofs and streets.

I used to swim with Tchaikovsky at Greenwich baths. A friendly pool attendant, hearing I was studying anatomy, said he could get me a skeleton for free from a local cemetery that had been bombed! I didn't take up the offer. Tchaikovsky was an enthusiastic walker with whom I went into the country at weekends. One day we quite unsafely took a shortcut through a railway tunnel. We worked out that if a train was heard we should lie down until it had passed. In subsequent years I have often noted the recesses built in to tunnel walls for the safety of workers. Tchaikovsky had escaped from Poland before the Germans invaded. He came from a prosperous family. He was the first person to alert me to the fact that if I thought the Nazis were cruel torturers, the Russians were far worse.

Ian Thomas, a bright student from Ynysybwl, a mining village in Wales was my closest companion in the first year. He had in contrast to myself an adequate allowance, and knew his way around London's West End. We went to an occasional theatre, but more often had lunch at the Leicester Square Lyons Corner House. In the Salad Bowl restaurant we could eat as much as we wanted for half a crown.¹ The student restaurant was poor so we frequently had a meal at one of the many nearby pubs. The most agreeable one was the old staging inn, the George, which was old enough to be the setting for Chaucer's Canterbury Tales. It is now a National Trust property. We routinely had a few hard crust rolls with a thick slice of cheddar cheese and a half pint of delicious bitter. Afterwards we wandered back to our very run down students' common room where my most vivid memory was watching senior dental and medical students playing poker for one-pound stakes. They looked serious. Because sport had been such a large component of my life at school, and as ability at sports was thought to be one of the reasons students were selected, I joined the Guy's B rugby team. They played against adult teams and I, at 17-years-old, was not robust enough.

Early clinical studies

I repeated the failed examinations and attended a course in anatomy and physiology, passing the exam in September 1946. The anatomy lecturer, who illustrated his lectures on the blackboard with coloured chalks, was excellent and easy to follow. Paradoxically, though the war was still on when I started anatomy, there was a shortage of bodies to dissect, so I learned all my

¹ £3.62 in today's money.

anatomy from prepared dissections. Frankly, I was relieved not to have to bend over the naked formaldehyde-preserved corpses, to locate their organs, reveal the muscles and follow the paths of nerves and blood vessels. At the same time, I followed a course on the properties of dental materials and passed the exam in September 1946. The speed with which we took these different subjects suggests our knowledge must have been very superficial. I'm convinced most of my examination successes were dependent on either first class teachers or well written textbooks, the latter always making up for any incompetence of the former. There were excellent anatomy texts, and a newly published text on dental materials was a revelation.

I began my clinical studies in 1946 in the Prosthetics Department. My first patient, for whom I had to construct full upper and lower dentures was a very thin little old lady dressed entirely in black with a hat, and with boots that laced up to just below her knees. She lived in Bermondsey, and was supposedly benefiting from the free treatment she was entitled to² for acting as a guinea pig for students. Reasonable results were assured by very competent clinical teachers who checked every stage of the construction and fitting of the dentures, both in and out of the patient's mouth. The first thing I had to do was to take an impression of her toothless mouth with plaster of Paris. The mixed plaster was loaded onto a tray that approximately fitted the patient's mouth and shoved into her mouth. As the soft plaster ran out of the back of the tray the poor patient would wretch helplessly and one hung onto the tray for dear life until the plaster had set. In a few minutes it set rock hard. One then had the challenge of freeing the solid plaster from the toothless gums. My old lady was very understanding.

From this impression I made models of the gums on which I constructed bite blocks to establish how the old lady's jaws related to each other. Then I mocked-up a set of porcelain teeth secured by a thick layer of wax onto a hard shellac base, which was closely adapted to the contours of the patient's mouth. It took me a long time to construct this wax model denture. With some trepidation I recalled the patient. She arrived dressed in the same identical black clothes and seemed none the worse from our previous encounter. I tried the wax model with porcelain teeth in the lady's mouth. As she was uncomplaining I went in search of a demonstrator to check the work and obtain his signature of approval. The only demonstrator that afternoon had a tail of students waiting for him to give approval for their work, and so I patiently took my turn totally oblivious of the disaster that awaited me. When it was my turn and the demonstrator followed me to my little old lady, I saw with horror that she was sitting forward in the dental chair spitting the porcelain teeth out on the floor, as one by one they became loose in the wax that was softening in her mouth. In ten minutes she effectively undid two weeks work. If ever there was confirmation that dentistry was not meant for me, this was it. Eventually,

² We have to remember this was before the National Health Service, which did not start until July 1948.

with the help of the technicians, I finished and fitted the denture for the old lady. Just when one felt the job was completed she would come back because the dentures were causing ulcers. I often suspect that when she no longer came back, she had consigned the dentures permanently to a glass of water by her bedside.

Along with this introduction to patients, as part of the technology needed for constructing dentures, we were introduced to the mysteries of numerous dental materials. We began by pouring plaster, discovering the right balance of plaster and water. Fortunately the newly developed elastic alginate materials were introduced at this time for taking impressions of patients' mouths. We made plaster models of dentitions by pouring plaster into moulds and learned the secrets of avoiding air holes. We manipulated wax and shellac. We melted and poured metal. We arranged artificial teeth into mock up dentures until they were finally made into dentures, using the latest acrylic materials. Previous to acrylic, dentures were made in vulcanite. The old vulcanising ovens were still being used for repairing the old dentures.

The technicians who taught us to manipulate these materials were among the most competent teachers we had. They were not only superb craftsmen in their own right, but they were the most kindly and sympathetic teachers. I did not have a natural ability with making things with my hands and I was slow to learn, and I am sure that without the support and encouragement of the technicians, men like Mr King and Mr Baker, I would most certainly have left dentistry then.

Among the clinical teachers was Professor **H R Fenn**, head of the Prosthetics Department. What he did with his time I had no idea but assume, as he was a professor, he engaged in research. He gave a few obscure lectures, but remained remote from the students. Among the clinical staff was Mr James Mansie, a part time demonstrator who practised in the Harley Street area. He was a marvellously flamboyant character, and when he was on the clinic was known to toss a denture made by a student that wasn't up to standard out of the window. I particularly appreciated Mansie because he had read widely, including Joyce's *Ulysses*, and I was smugly pleased when he wrote on a test paper of mine that I had written in good English, but what I had written had little relevance to the subject matter. Mr Kenneth Liddelow was a humane and understanding teacher who revolutionised the quality of the work done by the dental students. He subsequently became professor of prosthetics and dean of the Dental School at King's College Hospital.³ Mr xxx Wheatley, the other prosthetic clinical demonstrator, had a practice in Beckenham. He was a very competent and practical clinician. By chance he had been in the Royal Army Dental Corps during the war and served in India under my father. He told me he remembered one evening in Delhi sharing half a bottle of whisky with my father. Though Wheatley claimed he drank only a

³ He was co-author of H R B Fenn, K P Liddelow and A P Gimson, *Clinical dental prosthetics*, Bristol: Wright, 1961.

modest amount he woke with a terrible hangover. When he went into the office in the morning my father, sharp as ever, asked why he had kept him up drinking so late? Wheatley was amused by the experience. He subsequently treated me in his own practice. I was always the last patient of the day. After the treatment was completed I sat and drank glasses of sherry with him.

The difference between the technical and clinical teachers was partly attributable to subtle English class distinctions. Dentists in 1945 were still sensitive about these distinctions because of the Dentist Act 1921. Until then anybody could set himself up as a dentist. From 1931 those with qualifications were called "dental surgeons" and those without, "dentists". During the war the distinction between dental surgeons and technicians was very clear. Clinicians called up into the armed forces were immediately given an officer's commission whereas the technicians were conscripted into the Other Ranks: the highest ranks they could achieve were sergeant major and rarely warrant officer.

Dental surgeons had to undergo a five-year training⁴ and had to pass examinations of a university or a Royal College of Surgeons. Technicians learned by apprenticeship and the City and Guilds examined their skills. They were not allowed to work directly on patients. Technicians were "instructed" to make dentures to specific specifications by clinicians, who then adjusted the finished dentures to fit the patient's mouth. The clinicians employed technicians to do the practical work. There was a very big gap in the wages the latter received and the fees the dentists earned. I, of course, learned all about the making of dentures from my apprenticeship under the technicians and have always remained grateful for what I learned from them. In the end I was able to use all the materials with reasonable skill, and I was very proud when Mr Baker congratulated me on a gold denture that I had made under his guidance, which he rated as a fine piece of jewellery.

Materials and equipment innovations

I started dentistry coincident with several innovations in new materials, which greatly increased the ease of the work. Very accurate impressions of the mouth could be taken with the new alginates. Acrylic was introduced to make denture bases and artificial teeth and quickly replaced the old vulcanite and porcelain teeth dentures. A new kind of articulator that imitated the movements of the jaws was introduced to replace the simple open and shut articulator with which I learned. Local anaesthetic was supplied in convenient cartridges, assuring sterility and a known measured amount. Foot pedal drills were superseded by electric engines. Only after I qualified did turbine-driven drills come in. The dental unit concept with water, air, and incorporated suction in an easy to reach and move holder was introduced. There was superior lighting and an electric engine which drove an easily adjustable drive

⁴ 4 years if they had previously passed chemistry, physics and biology.

arm for the drill. The dental chairs were designed for easy adjustment by simple controls.

Accommodation change

At Blackheath I was cut off from my friends who lived on the west side of London, so I moved to be near them in Fulham. As a result had limited contact with my fellow students and only socialised with them at lunchtimes. One senior student laughingly berated me for always having a non-dental book in my hand, and suggested that there would be plenty of time to read for leisure when I retired. He even thought I should be reading English. I smiled quietly to myself. It is difficult to imagine what kind of persona I projected. On another occasion I was asked from where I had got my posh accent. I was mortified as it was the last thing that I thought I had.

After two years as a dental student, it was increasingly obvious to me that I shouldn't be studying dentistry and now the war was over, my original concern to avoid combat was no longer an issue. The theoretical dental course was superficial and the idea that dental students didn't need to know anything in depth, as true as in some subjects it might have been, really bugged me. The superficial academic content and the multiple practical tasks I learned, was an education for a Jack-of-all-trades and a master of none. Some clinical teachers, although excellent at supervising our clinical work, were often appalling lecturers. There was one dental consultant who gave us lectures on dental anatomy. Even then I recognised he didn't understand the subject he was supposed to be teaching. I constantly talked about giving up dentistry, but my elder brother influenced me to stick with it. My father was paying for my education as there were no student grants in those days, and my brother said, as I had already spent two years or more as a dental student, why not finish so I could be sure of earning some money. "Then you can do what you like." He was right, but not quite in the way either of us imagined. It was also a time when there was an acute shortage of money at home and I knew what deprivation was all about.

I and a few other students were among the last to obtain a place at Guy's straight from school, as places became reserved for ex-servicemen, a number of whom I got to know well and whose friendship I greatly valued. They were very serious students and eager to catch up on lost time. Many of them were married and had children. One ex-major still wore his great coat in winter and arrived at the hospital in a green Bentley. Some of the ex-servicemen had had fearful experiences, but only occasionally did they ever mention them to us. It was as if they wanted to put that all behind them and forget. For some reason or other, they always felt we younger students learned more easily than they did, but I'm not sure we did. With their family commitments they probably had less time than we did; and we with more time did not use it effectively. Their presence on the course greatly influenced the way we were all treated by the staff of whatever rank.

Among my contemporaries I particularly remember those who had superior skills. They instinctively knew how to handle materials and achieved very high standards of workmanship, and did so very quickly. Russell Venning, an ex-serviceman, was impressively competent in achieving these high standards.

As a group we got on well together, with a very generous give and take atmosphere. In all my time as a student at Guy's there was only one occasion when the spirit of generosity failed. There were one or two Jewish students. One of them, Leonard (Lenny) Rees, somehow flaunted the privileges preserved for senior students. They were quick to take their revenge and cornered him in the locker room, and after debagging him, encased part of him in plaster. I happened to be in the locker room at the time and wondered if their revenge was more motivated by anti-Semitism. Lenny was a clever person, who amazed me by his freedom from the restraints of conventions, even taking himself off on his own to a nudist camp. I couldn't imagine myself doing such a thing. Rees subsequently became a lecturer in dental anatomy with James Henderson Scott⁵ at Queen's University. Alas he died tragically in a Belfast plane crash in 1952. His work on the temporo-mandibular joint was published posthumously.⁶

Conservative dentistry

After what seemed an unceasing toil as an apprentice technician making over 20 upper and lower and several partial dentures, we started on the phantom head course which at its simplest was about filling of teeth. We were taught how to drill teeth to removed decay and then restore them tooth to function using various filling materials. Different to today's students, the first thing we did was to purchase a complete set of instruments: probes and mirrors, excavators, chisels, scalers and an array of essential equipment, syringes, drills, methylated spirit burner, and a miniature cotton waste receiver, all contained in a robust and cleverly designed multi-drawered wooden cabinet. It took time to organise this equipment so I knew where to find a particular instrument at a moment's notice.

I realised we were getting near our ultimate goal of treating patients when we had to select a complete set of teeth from a bowl containing hundreds of recently extracted teeth, some of which still had bits of skin attached to them, to fit in their correct location in the brass jaws of a mock up head, the phantom head. The most difficult part of this task was recognising which tooth went where. Lower molars with two roots and upper molars with three were easier enough, but when it came to premolars, they looked so alike. Were they

⁵ W A B Brown, James Henderson Scott (1913-1970): Charismatic teacher, *Dental Historian* 2010; 52: 32-40.

⁶ L A Rees, The structure and function of the mandibular joint, *Brit Dent J* 1954; 96: 126.

uppers or lowers? Were they right or left. None of us was absolutely sure? And as for which lower incisor was which, who knew. I never thought that in my subsequent career I would publish a booklet on how to identify teeth for archaeologists.⁷

A recently appointed young lecturer, Guy Marrant [later professor of conservative dentistry at the Eastman], was responsible for introducing twenty enthusiastic students to the mysteries of restorative dentistry. In six weeks he had to prepare us for working on patients. After we had set up an upper and lower jaw with teeth we drilled holes in them with a variety of cutting heads or burs. Our drills were driven with foot pedals. To operate the foot drill at the right speed and apply the drill to the tooth was a feat in itself.

The most used filling material was an amalgam of tin and lead powder mixed with mercury in a pestle and mortar. It fairly rapidly changed from a soft putty consistency to a hard durable metallic substance, and the trick was to get the cavity in the tooth filled up before the amalgam had set. We learned how to make gold inlays. I recall how obsessive Marrant was that the edges of our finished inlays should be totally flush with the enamel surface of the tooth. Some achieved this with astonishing dexterity; and I more slowly followed behind. There were those who were never satisfied until they had achieved perfection, and those who steadily worked away regardless of the time they had to spend. I was more easily satisfied.

One demanding task we had to complete was carving in hard green wax exact replicas to scale of several teeth. It took me hours to reach the required standard: I took the wretched teeth home with me to work on them at night.

We all passed the test and were ready to have our first patients.

First fillings patients

Heaven knows what the patients would have thought if they had realised that we were about to test our newly acquired skills for the first time on them. The patients had been specially selected because they only needed simple fillings. I arranged the appropriate instruments on the bracket table that could be swung backwards and forwards over the patient, firmly took hold of my mouth mirror and probe and tentatively began to explore the patient's teeth for the tell-tale evidence of decay. I don't remember being told that cold mirrors immediately clouded over in the heat of the mouth. So, that I thought was, what the methylated lamp was for, but I noticed how anxious the patient looked as I warmed the mirror in the flame. As my first patient opened her mouth, I was unexpectedly confronted, after practising on the inanimate phantom head, with the additional challenges that the teeth were sandwiched between the

resistant muscles of the cheek and tongue and that saliva flowed everywhere hiding the lower teeth from view. I was anxious too, anticipating when the patient would feel pain and shout in agony. How far could I drill before that occurred?

I quickly found a small black spot in an upper molar tooth in which my probe stuck and I began to drill with an inverted cone. We were still only allowed to use foot pedal machines. Electric engines were reserved for the senior students, the assumption being that in our inexperienced state, we could wreak havoc with a powered drill. My first filling was happily very small and after an hour or more the patient was released. Each stage of the preparation had to be checked by a demonstrator: the cavity had to be free of caries and all the fissures, those multiple infoldings on the tooth's surface, had to be cut away, and then the undercuts had to be made to retain the amalgam filling.

We had only had one patient booked in for the afternoon, but later we would have one booked in for every hour. I can hardly believe how exhausted I was by these first patients because when I returned home I sat in a chair and fell into a profound sleep. But after a few weeks I got used to the work. We progressed from small fillings to larger ones, and then came the great challenge of giving a local anaesthetic to stop the pain. It was easier enough to stick the syringe into the soft tissues overlying a tooth, but to inject the anaesthetic for a mandibular block deep into the tissues around where the nerve went into the bone of the jaw was a very different challenge. Thrusting the needle through the muscles could be very painful, but more alarming was the threat that the thin needle would break off deep in the tissues. It happened sometimes, and we were told the needle might never be recovered. By 1947 we were using cartridge syringes, which were a great advance of the old fashioned record syringes into which you sucked the anaesthetic fluid. However, we used detachable needles on several occasions, simply sterilising them between each patient. It says much for the resilience of the human body that there were very few reports of patients complaining. If they did I never heard about them.

Once I started treating patients I rapidly picked up the necessary skills. Our progress was strictly monitored by a number of competent and universally helpful demonstrators who divided their time between Guy's and their private practices. In overall charge was a senior academic, Professor W. E. Herbert and under him, Mr W A (Nick) Vale. They were responsible for giving us introductory courses to advanced aspects of conservative dentistry. Herbert would demonstrate how, for instance, a crown to cap a tooth was made. He was not a skilled teacher, and of all the clinical lecturers I had, I learned least from him. Vale, on the other hand, was far more effective. It was to him I turned if I needed help. I had a very complex crown to make on one of my early patients. Vale told me to drill parallel narrow holes into an upper central incisor for pins that would secure the crown to the tooth. Success was totally

⁷ W A B Brown, *Identification of human teeth*, *Institute of Archaeology Bulletin* 1985; 21/22: 1-30.

dependent on absolute precision and had to be achieved visually. My problem was realising there was no room for error – a mistake could lead to the loss of the tooth. I knew I had not got the skills. Vale came to my rescue and after two or three visits the special crown was made and fitted. He led me to believe it was my achievement.

Practising how to restore teeth was spread over several sessions a week for two years, and the number of fillings we did in amalgam and gold and the crowns and bridges we made were publicly recorded every month on a large notice board. Every tooth we worked on was identified by a docket signed by an authorised clinician and handed to the secretary. We did any technical work, eg the casting of inlays, for ourselves under the supervision of the highly skilled technicians. In between we did a short and inadequate course in which we were expected to understand how to straighten children's teeth. We didn't. We learned how to extract teeth under local and general anaesthetics and do minor surgery. All the clinical subjects were accompanied by a series of lectures, which varied a great deal in focus and lucidity. A series of lectures, specially edited for dental students, on medicine, surgery, pathology were among the best lectures I ever had at Guy's.

Patients

Our first patients in any particular branch of dentistry were always the faithful public living near to the hospital. As we became more expert, fellow students would treat each other. Even our relatives would take a chance: I did several gold inlays for my sister and fillings for my brother. I slowly built up a practice of friends. One told me in 1999 that three of the gold inlays were still in place but the amalgam fillings had all been replaced. He remembered I told him they would last 25 years; they have survived 51 years. Apart from the social advantages of treating my friends a special benefit was that in summer, in fine weather fine, we could scrap the appointment and for walks in the country.

Mixed in among these friends and relatives were patients randomly allocated from the waiting lists, so you never knew what kind of person to expect. I was surprised by the confidence that many of the younger professional people had in my fledgling skills. One was studying anthropology: we discussed Margaret Mead and Ruth Benedict whose books I was coincidentally reading at the time. She wondered how I could be happy doing dentistry. Another was an economist who I used to meet for a drink in the West End. It is surprising with so many distractions, that I got sufficient work done to fulfil the required quotas.

Oral surgery

Before extracting any teeth, we carefully revised our knowledge of how

these strangely removable mineralised appendages were shaped, how they were attached to the bone and exactly what was their relationship with the bone. These essential details enabled the experts effortlessly to extract teeth.

An added dimension to extracting teeth was an effective local anaesthetic. This very much depended on knowing exactly where the nerves to the teeth and their surrounding bone and soft tissues were located. Modern patients rarely tolerate pain.

In spite of expert supervision, it was inevitable that in our inexperienced hands roots of teeth were broken and they had to be removed. Sometimes it was easy, but on occasions it involved minor surgery, all of which we learned to do. Our effectiveness was very much related to the skills and confidence of our demonstrators. Mr Roy Whitlock⁸ was so expert that he inspired us all with confidence. Under his guidance many of us achieved very high proficiency. When I was serving as a dentist on my own in Nigeria⁹ I often relied on the knowledge I learned from Whitlock.

Removing teeth under a local anaesthetic was a comparatively steady and measured procedure, but extracting them under a general anaesthetic could be very stressful. Some patients reacted under the anaesthetic in an alarming physical way. Imagine a large room with a robust old fashioned dental chair in the middle with three trolleys to hand: one for the dentist with an array of instruments and forceps; one with instruments and drugs for the anaesthetist; and a third with the equipment necessary to deliver the general anaesthetic and to hold the black cylinders of nitrous oxygen and the white cylinders of oxygen.

The procedure was simple. The patient sat down and was restrained in the chair by placing a thick leather strap around their waist. A cotton wool bung was placed at the back of their mouth to stop the extracted tooth or parts of it going down the trachea and their mouth was propped open by a metal gag which had rubber inserts to rest against the biting surface of the teeth. This gag was critical because the effect of the nitrous oxide is to cause the muscles to contract and tightly close the mouth. Once the gag was in place all was ready for the anaesthetist to put the mask over the patient's nose. The patient was told to breathe steadily. As the oxygen in the blood was replaced by nitrous oxide the patient would go slightly blue and quite quickly become unconscious. If the teeth to be extracted were in the upper jaw or on the lower left jaw, the surgeon, if he was right handed approached from the front, but if the teeth were on the lower right jaw, the surgeon had to stand behind the chair, and then the anaesthetist would somehow continue holding the mask in place without impeding the surgeon. If there were only a few teeth to remove,

⁸ Who later provided outstanding maxillofacial treatment for Belfast bomb injury patients.

⁹ W A B Brown, National Service in the Royal Army Dental Corps in Nigeria 1951-1953, *Dental Historian* 2010; 51: 76-84.

the operation was swiftly completed, but sometimes when all the teeth were to be extracted, there could be problems. The first was that the jaws would have to be levered open by a Masons gag with handles which could be difficult to use. Secondly the sockets from where the teeth had been extracted bled profusely and the blood obscured the teeth remaining to be extracted. Lastly one felt anxious because many patients under prolonged anaesthesia were at risk. There were other hazards related to the teeth. Roots could easily break off and be left behind in the bone, crowns of broken down teeth could easily fragment. Sometimes patients were very resistant to the anaesthetic and when they came round from the anaesthetic could be very excitable and had to be restrained to prevent them from hurting themselves or others in the room. We were told they were dockers who were sustained by above average intakes of alcohol. I can't believe such high-risk surgery is practised today.

As students we started off by watching the procedure. Then we were given our first experience of extracting a tooth. The surgeon in charge would make sure we identified the correct tooth to extract and that we had chosen the correct shaped forceps for the job; and only intervene if we ran into trouble. The most frequent mistake was the breaking off of roots. They would often be removed on the spot by an experienced operator; but if left they would be removed at a later date under the calmer conditions of a local anaesthetic. I didn't like these sessions, but as I gained a clearer idea of the detailed anatomy of the tooth and the surrounding structures it became easier and less daunting.

East Grinstead

In our final year we went for a day to visit the Maxillo-Facial unit at East Grinstead Hospital run by (later Sir) Terence Ward. He demonstrated his surgical skills while we watched from a balcony overlooking the theatre, which was sealed off by glass panels. Ward removed impacted third molars with such skill that he made the equivalent operations I had seen at Guy's look amateurish. Terence Ward became responsible for establishing maxillofacial surgery as a well-defined discipline. For the latter dentists were encouraged to become medically qualified and eventually had to be. Ward was following in the steps of Kelsey Fry who had worked along side Archibald McIndoe in the plastic surgery unit set up in the Second World War. Ward helped the Royal College of Surgeons to set new high standards for dental consultants in whatever field they were working. In the end, it was all related to the depth and quality of their education and training.

Qualification

I qualified in June 1950. After taking the final exams felt very deflated. I had found the exam papers relatively easy to do, thinking they didn't properly

reflect the extent of my knowledge. I applied for a house job at Guy's as did most of us. I was surprised and pleased to get one. I was appointed as house surgeon for the first three months to Mr Alan Thompson, one of the most energetic and stimulating consultants; and for the second three months to Professor Herbert.

Among the house surgeon's responsibilities to his consultant were to attend his clinics and make notes, and prepare patients prior to in-patient surgery. Thompson was a very competent operator, always looking for improvements and refinements on the standard techniques. I assisted at his operations in a very minor role. He encouraged me to make detailed notes of any case of special interest, or where there was something special to be learned. Thompson was a man of many interests. He was especially enthusiastic about high quality workmanship: a suite of furniture specially designed for him was in an exhibition of Modern Furniture Design at the Victoria and Albert museum.

Working with Professor Herbert was very different. I always carried out his requests as efficiently as I knew how. I used to assist at his in-patient operations. They were usually for the removal of impacted wisdom teeth, nothing particularly demanding. After the teeth had been removed, Herbert would ask me to stitch up the wound.

I did a couple of nights as weekend resident house surgeon for emergencies. It was hell as far as I was concerned. I was called out several times during the night and by Monday morning I was exhausted; but I still had to do a routine day's work, just as the resident house surgeon did every day. I decided there and then that whatever else I might do in dentistry, I would never choose to take an appointment which involved weekend work.

My six-month's house post came to end all too quickly. It was very important to me. I believe it gave anyone, who was appointed to one, credibility for a future career in the hospital or clinical academic worlds.

My next destination was the Royal Army Dental Corps at Aldershot to where I went to start my two years of National Service.¹⁰

Assessment of six years at Guy's Hospital

I am a practically minded person, but not particularly good with doing practical things. I was never adept with my hands in the way that some people are. However I learned to carry out a wide variety of dental procedures to an acceptable standard, but I did not like doing repetitive tasks that I could carry out automatically or procedures that had to be endlessly repeated.

In my opinion Guy's Hospital gave excellent clinical training, which particularly prepared students as dentists to work at a very reasonable level of

¹⁰ Ibid.

competence in general practice. The teachers made no pretence of offering a scientifically based understanding of dentistry. Essentially we were taught authoritatively. There was little room for questioning. But that is how it was everywhere at that time.

Such was my conviction about this I spent my early years debating what aspect of dentistry to pursue. I eventually decided that orthodontics would provide the essential variety of work. But that is another story.

LETTER TO THE EDITOR

Dear Sir

I read the article in the recent number of *Dental Historian* on seated dentistry¹ with interest. When I entered the Conservation Room at Guy's in 1956 everything was carried out standing up. I was blessed with flat feet from a very early age. After a day's work standing up my feet were complaining bitterly. I decided that if I was going to last the course I had to teach myself to do the job sitting down. So with modifications to the spray and suction facilities on the dental unit using tubing, flattening and tilting the chair back as far as it would go to allow the patient's head to lie between my knees, I could easily do the job. Professor W E Herbert used to watch me work, seemingly for hours, often shaking his head in disbelief that this was possible. I found that at the end of the day I was not tired, my feet were uncomplaining, and the work output had increased without standards being compromised.

I believe I was possibly the first student at Guy's to adopt this approach. There were a few stools in the Department with height adjustment but were generally used for consultation purposes.

Ironically I spent most of my career standing up in operating theatres where you are not standing still but the patient is (still) in the recumbent position. However if I had an intricate and delicate procedure to carry out, I would often sit down.

Yours sincerely
John Bradley
Clitheroe, Lancs

BYRON'S APPRECIATION OF HIS DENTIST

The following note appeared in the *British Dental Journal* in 1914.² It said according to the *Daily Chronicle* the profession of dentistry - the latest to be invaded by women - stood higher in Byron's esteem than the profession of arms. In September 1820 on hearing that his favourite dentist had died, Byron wrote to John Murray: "The death of Waite is a shock to the teeth, as well as to the feelings of all who knew him. I left him in the most robust health, and little thought of the national loss in so short a time. He was much superior to Wellington in national greatness, as he who preserves the teeth is preferable to a warrior who gains a name by breaking heads and knocking out grinders. Who succeeds him? Where is tooth-powder, mild and efficaceous - where is tincture - where are clearing roots and brushes now to be obtained? I knew that Waite had married, but little thought that the other disease was soon to overtake him."

¹ Rachel Bairsto, Stuart Robson, John Craig and Ian McIntyre, Seated dentistry, *Dental Historian* 2011; 53: 87-89.

² *Br Dent J* 1914; 35: 602.

FORENSIC IDENTIFICATION OF A DAMNED COUPLE: ADOLF HITLER AND EVA BRAUN

Xavier Riaud*⁺

Adolf Hitler (1889-1945)

Really bad teeth

Hitler had very poor teeth and extremely bad breath.¹ Before the war, he asked Blaschke, his dentist, to immobilize his teeth with a dental bridge. He wanted that bridge to be in place for several years. Thus, Blaschke made an unusual and easy-to-recognize solid metal bridge.

End of war...Beginning of the investigation

On 30 April 1945 Hitler committed suicide. His body was then burnt in a bomb crater in the garden of the Berlin Chancellery, amongst other corpses which were buried afterwards.

Despite an investigation by British officer Trevor-Roper, and despite being approached diplomatically, the Russians did not answer any questions concerning this affair until 1954. It was only when Blaschke's dental mechanic who made the bridge, Fritz Echtmann, was released from prison – he had been interned in Russia for nine years – that the world learnt about the exact fate of the Führer and his wife.² On 15 October Echtmann said he had been arrested by the Russian secret services on 9 May 1945 in his house in Berlin. In the same year, once she was released and back from Russia, Blaschke's assistant, Käthe Heusermann also attested to having been arrested on 9 May.³

Post-mortem examinations

The Führer's body was found on 3 May 1945 by Smersh agents, the Soviet Army's counter-intelligence department. On 8 May it was brought to a hospital in Berlin's suburbs to be examined. On 9 May his dentures, found on the cadaver, were shown to the assistant of Hitler's personal dentist and to the dental mechanic who had made them.⁴ Echtmann recalled⁵ the Soviets had shown him a lower jaw which had been cremated with two gold bridges and another one divided into nine pieces

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¹ David Stephenson, 'Discovering the truth, the whole tooth about Hitler's death', in *Daily Express*, London, 29 June 2003, pp. 54-55.

² Henri Lamendin, *Anecdodotes*, Paris: Aventis, 2002.

³ Wolfgang Kirchhoff (ed) *Zahnmedizin und Faschismus*, [Dentistry and Fascism], Marburg: Verlag Arbeiterbewegung und Gesellschaftswissenschaft, 1987.

⁴ Lamendin, op. cit., fn. 2.

⁵ Søren Keiser-Nielsen, *Teeth that told*, Odense: University Press, 1992.

which was also in gold and which came from his jawbone. Indisputably, he remembered the work he did for Hitler. He was shown a gold-filled bridge, which was similar to that of the mandible which Eva Braun used to wear. When he was imprisoned, he submitted an additional nine-page report on the matter. At the same time the assistant identified the various elements of dental prosthesis that were being shown to her. Both of them remembered well the red box in which Hitler's remains were stored, and of the tall blond interpreter who aided discussions with the Russians. Those two statements were published, yet doubts remained. The need of an official report without flaws and coming to an indisputable and irrefutable conclusion became obvious.

First public revelations

In 1965, Yelena Rzevskaia, the blond interpreter whom Echtmann and Heusermann mentioned, published a report entitled 'Berlin, May 1945' in a Soviet magazine. It was then published as a book and translated into numerous languages in 1967. This work told how the Russians discovered thirteen charred corpses in the gardens of the Chancellery; and how, in the following days, they were examined by a commission of five specialists conducted by lieutenant-colonel Faust Schkarawski in the Russian Field Hospital N° 496 of Berlin-Buch.

On the afternoon of 8 May the commission handed over a red box to the Smersh. It contained jawbones and gold bridges from bodies numbered 12 and 13 which were suspected to be those of Hitler and Eva Braun. This box was handed to the interpreter. The following day, the Smersh looked for Hugo Blaschke, his dental prosthetist and his assistant. At the clinic of Kurfürstendamm they found out the dentist had left Berlin for Berchtesgaden under the Führer's command on 19 April. However, they succeeded in taking in the two others for questioning. They were asked about the contents of the red box which was shown to them. All they said was immediately recorded before they had the chance to examine the human remains. On 10 May the Smersh sent a report to Moscow. It concluded the two remaining bodies had been identified as those of Hitler and Eva Braun.⁶ The red box and its contents were returned to the Soviet capital.

Lew Besymenski, a Russian journalist

In 1966 Lew Besymenski, a Russian journalist and cultural attaché for West Germany, published a book entitled *Der Tod des Adolf Hitler* [Adolf Hitler's death]. It was translated into several languages, including French in 1969 by the Plon Editions. In that work, the words of Colonel Gorbushin, the director of the Russian secret services, Col Schkarawski as well as other members of the commission in charge of the post-mortem examinations of the corpses were quoted. The complete transcriptions of the examination sessions of the thirteen bodies as well as pictures of pieces of bridges were in the book. For the first time dental experts from different countries could examine in the book the few post-mortem elements of Hitler and Braun. The issue was that Besymenski's book did not give other comparative perspectives of other post-mortem elements. Indeed, the book never mentioned elements from the dictator's dental file as well as his x-ray copies. Consequently, no verification of the final results was made possible.⁷

⁶ Ibid.

⁷ Ibid.

Reidar Sognaes and his investigations

In 1971 Dr Ferdinand Strøm from Oslo asked for Prof Reidar Sognaes's help. He was a former dean of the University of California at Los Angeles' (UCLA) dental school. Strøm recalled for Sognaes that the Americans had captured Blaschke in Berchtesgaden in November 1945. Thus, there was an interrogation report in the army's archives in Washington. Given Sognaes's rank, they wondered if he might get further advice on the affair. The pre-eminent practitioner immediately went to the capital and was allowed to research in the national archives. Soon he found the American secret services' file on Blaschke's interrogation conducted in November/December 1945. The German dentist described Hitler's, Braun's and Martin Bormann's teeth. Comparing Besymenski's photographs, both common features and differences were found.

After further investigations Sognaes found five x-ray copies of Hitler's head, three dating from September 1944 and two from 21 October 1944. This set of radiographs was made because the dictator was suffering from sinus problems. Those images gave more details concerning the dental work carried out in his mouth and were indisputable. The professor had found objective documents indisputably identifying Adolf Hitler.⁸

Epilogue

During the 6th meeting of the International Academy of Legal Medicine in Edinburgh, Sognaes (along with Strøm) confirmed the identification of Hitler from his teeth to a group of international experts (Keiser-Nielsen, 1992);⁹ (Benecke, 2003).¹⁰ The two men published their results in 1973.¹¹

Figure 1 Fragment of Adolf Hitler's mandible (Benecke, 2003, © Benecke).



Adolf Hitler's teeth are now displayed in an unknown Ukrainian museum (Fig 1). Little information is given via this picture except for clearly visible periodontal disease with a loss of bony support on the left dental block, which could explain his "bad breath". On the right dental block, there is apparently a dental crown on a second lower right bicuspid.

⁸ Mark Benecke, 'Hitler's skull and teeth', in www.benecke.com, 2003, pp. 1-3.

⁹ Keiser-Nielsen, 1992, op.cit., fn. 5.

¹⁰ Benecke, op.cit., fn. 8.

¹¹ Reidar Fauske Sognaes and Ferdinand Strøm, The odontological identification of Adolf Hitler. Definitive documentation by x-rays, interrogation and autopsy findings, *Acta Odont Scandinavica* 1973; 31: 43-69.

Eva Braun (1912-1945)

Idyll with the Führer

Braun met Hitler in 1929 when she worked for the official photographer of the Nazi Party.¹² After her two suicide attempts Hitler decided to get close to Braun so invited her to his villa near Munich. By 1936 she was a part of his household at the Berghof. Braun did not attend public events with Hitler. In 1943 her sister married an SS General who was close to Heinrich Himmler. The dictator used this as an excuse to facilitate his companion's involvement in official duties. In April 1945 she went to Berlin to be by his side in the Führerbunker. They married on 29 April 1945 and committed suicide together on the following day.

Doubts remain...

In Besymenski's book, which was mentioned above, there is a picture of a bridge from the mouth of body n°13, later identified as Braun's. Blaschke's assistant and his dental mechanic had identified this prosthetic work. Moreover, the German dentist described it in his notes handed over to the American authorities at the end of 1945. There is no formal reason to doubt those testimonies even though they were all collected from memory after the main characters' death. However there are no ante-mortem documents concerning Braun's mouth before her death.

Many experts considered Besymenski's picture as sufficient proof to identify body n°13. Others thought differently. In June 1981, at a meeting in Bergen, Norway, of the International Association of Forensic Sciences, a pre-eminent specialist expressed doubts concerning Braun's identification.¹³

Strøm and Keiser-Nielsen wondered about the identification

Ferdinand Strøm and Søren Keiser-Nielsen immediately decided to reconsider Braun's identification.¹⁴ They remembered the photograph in the English edition had shown not only the bridge used as key evidence in this case, but also what was described in the Russian autopsy: "A piece of yellow metal (gold) of irregular shape measuring 6mm x 3mm (presumably a filling)." Apparently nobody had paid much attention to the filling so the two men decided to study it carefully and to consider it as fully-fledged incriminating evidence. After a close study of the picture they were convinced it had a small cast filling, probably a gold filling. The two men could not conceive that Braun would have accepted anything but the best. With the bridge beside it to allow for a comparison of size, they agreed that this was a filling from an upper bicuspid, lying on a small flat basin with its occlusal surface turned towards the camera.

One question immediately came to their mind.¹⁵

¹² Thierry Feral, *Le national-socialisme, vocabulaire et chronologie* [National Socialism, vocabulary and chronology], L'Harmattan (éd.), Collection Allemagne d'hier et d'aujourd'hui [Yesterday and today's Germany Collection], Paris, 1998.

¹³ Keiser-Nielsen, op.cit., fn. 5.

¹⁴ Ibid.

¹⁵ Benecke, op.cit., fn. 8.

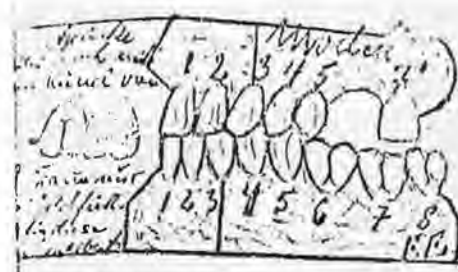
The dental prosthetist's report

With no available ante-mortem documents concerning Eva Braun's dental status, which one of the postmortem descriptions of her teeth should they rather rely on – Echtmann's, Heusemann's, or Blaschke's? They preferred Echtmann's report. Besymenski kindly sent them a copy of the handwritten German original sketches. When he was imprisoned, the dental mechanic gave a clear description with outlines to the Soviet authorities. He described the bridge inserted in autumn 1944. He also described another bridge made for Braun's left upper jaw. The two men were immediately fascinated by this report.

His sketch of her left side (Fig 2) shows the first molar tooth missing, while the second molar has been ground into a cone. A gold crown had been cast and it carried a replacement for the missing tooth in front. It was an extension bridge with an anchor at the other end of the bridge. In Echtmann's sketch this extension bridge with its anchor is shown to the extreme left.¹⁶ The bridge was not ready for insertion until 19 April 1945. Blaschke had to leave Berlin hastily so never had the chance to insert it. The Russians found the prosthesis on 9 May, when they searched the emergency dental clinic in the cellar of the Reich Chancellery for Blaschke's dental records.¹⁷

Figure 2 Echtmann's sketch of Eva Braun's left side teeth.¹⁸

To the left, the bridge that was never inserted.



beginning of April 1945.

Echtmann's sketches indicated no inlays in the other three upper bicuspsids. The upper bicuspid concerned was the one that could possibly be the "piece of yellow metal". The cut-out for the anchor was the explanation of its irregular shape.¹⁹

Comparative study

According to Keiser-Nielsen and Strøm,²⁰ the two experts decided to assess the size of the lower jaw bridge and the gold inlay seen in the Russian photograph. They

¹⁶ Keiser-Nielsen, op cit., fn. 5.

¹⁷ Michel Perrier, Identification of Adolf Hitler from cinematographic documents, in *Proceedings of the European IOFOS Millenium Meeting*, Leuven: Leuven University Press 2000, pp. 149-151.

¹⁸ Søren Keiser-Nielsen and Ferdinand Strøm, The odontological identification of Eva Braun Hitler, *Forensic Sci Int* 1983; 21: 59-64.

¹⁹ Ibid.

selected two natural teeth: a lower right first molar and a lower right second bicuspid. Their roots were cut off and their lingual surfaces ground away. The remaining crown parts were waxed together in a double pontic. They created an imitation in natural size of the replacement of the same two teeth in the bridge from body no.13. Then they selected an upper left second bicuspid. They drilled in it a standard cavity for a gold inlay. The cavity filled with dark-blue wax and a cut-out for an anchor made. The wax inlay was taken out, placed beside the double pontic with its chewing surface towards the viewer. A photograph was taken in which the natural teeth of the double pontic came out the same size as the corresponding artificial teeth in the bridge from body no.13. The wax inlay could be compared with a photograph of a reasonable degree of accuracy to the gold inlay in the Russian photograph. The wax inlay bears a more than striking resemblance to the gold inlay taken from the body no.13. It convincingly corroborates the Russian identification of body no.13 as Eva Braun.

Figure 3 Echtmann's sketch of Eva Braun's upper jaw.²¹
Teeth seen towards their chewing surfaces.



Conclusions :

On 30 April 1945 Adolph Hitler and Eva Braun committed suicide. Despite the Soviet authorities, who tried to hide their death and allowed uncertainty to persist on their death, the veil was finally lifted on this mystery by two dentists; in 1973 as far as the dictator is concerned and in 1981

for his companion. Therefore, the work accomplished by Prof Sognaes and Dr Strøm was unanimously recognized by international critics.

Who was Reidar Sognaes?

Sognaes (Fig 4) was born on 6 November 1911 in Bergen, Norway. He studied dentistry at the University of Oslo. Sognaes left for the United States in 1938, to become an intern at the Forsyth Dental Infirmary for Children in Boston.

He continued his apprenticeship at the Rochester School of Medicine and the New York University College of Dentistry where he obtained a Master's degree in physiology and a PhD in pathology in 1941.

In World War II Sognaes served as a Captain in the Royal Norwegian Air Force. After the conflict he taught at Harvard University. Sognaes was then in charge of the oral pathology service. He was dean of the Harvard School of Dental Medicine from 1952 to 1960.²²

²⁰ Ibid.

²¹ Ibid.

²² American Board of Forensic Odontology, *Diplomates Reference Manual* 2006.

Figure 4 Dr Reidar F Sognaes (1911-1984)²³

In 1960 he went to UCLA to found a dental school of which he was the dean until he retired in 1968.^{24, 25} Sognaes continued his research as professor of anatomy and oral biology and acquired international fame in terms of identification in forensic odontology.

Yet he was more famous for his observations on Georges Washington's dentures. Sognaes demonstrated that the first American president did not wear dentures with wooden teeth. He also identified Adolf Hitler's remains and those of his right-hand man, Martin Bormann, from archives gathered by the Allies.

Soon, the pre-eminent researcher focused on the pathologies of hard tissues and on calcifications in biological systems. His research allowed him to join a small circle of world specialists. He published more than 300 articles during his life. He was the first dentist to be elected a member of the National Academy of Sciences, Institute of Medicine. He was an honorary member in numerous international scientific societies and was also the chairman of the International Association for Dental Research, of the American Institute of Oral Biology and of the International Association for Identification in Forensic Odontology.

A busy man, Reidar continued to work until he died of a heart attack on 21 September.²⁶ He made his dream come true by founding the dental school in UCLA within the UCLA Health Sciences Center.

It is also essential to mention Dr Michel Perrier's research work from the Institute of legal medicine in Switzerland. He examined propaganda films from 1934 and 1944 in which Hitler was seen smiling or making a speech. His research drew a comparison between the images revealed by the reports and the Führer's dental archives. Helped with sophisticated film equipment the analysis of those documents indisputably constituted an additional contribution to the German Chancellor's identification.²⁷

Who was Hugo Blaschke?

Hugo Blaschke (Fig 5) was born on 14 November 1881 in Neustadt, Prussia (Schulz, 1989).²⁸ He qualified as a dentist in the USA. From August till December 1914, he served as a physician in an Artillery Regiment. In 1915 he practised in

Frankfort and then Berlin where he stayed till the end of the war. He received the War Merit Cross 2nd class with Swords and the Honour Cross for combatants.

Figure 5 Prof Hugo Blaschke (1881-1953)²⁹

In 1931 Blaschke joined the National Socialist German Workers' Party as member number 452 082 and on 1 March he joined Röhm's SA (Sturmabteilung or assault section). On 2 May 1935 Blaschke became a member of the SS led by Himmler; as a major with the number 256 882. He married on 1 July.

On 20 April 1937 Blaschke was promoted to the rank of lieutenant colonel on Himmler's general staff. On 20 April 1939 he became a colonel at the SS headquarters. By 1 January 1941 he was a colonel in the Waffen-SS and was also in charge of the Health Department. On 20 April 1941 Blaschke was promoted as Colonel-in-Chief in the General SS and, more particularly, in the general staff of the General Staff service. By 30 January 1942 he was Colonel-in-Chief in the Waffen-SS at the Health Department.

On 25 June 1943 Hitler appointed Blaschke as an honorary professor. By 1 October 1944 he was a brigadier general in the General SS. On 9 November he was given the rank of major-general of the Waffen-SS, near to the doctor of the Reich SS and the Police. Blaschke was in charge of all dental care for all the SS, and the police dental department, and was personal dentist to Hitler, Himmler, Goering, Braun and a number of other important people (Riaud, 2005).³⁰

After the war Blaschke was interned as a prisoner in Nuremberg (Schulz, 1989).³¹ He was sentenced to 10 years of imprisonment for War Crimes and Crimes against Humanity. His involvement in the exploitation of dental gold extracted from dead prisoners' mouths in concentration camps was considered indisputable.

Acknowledgements

Many thanks go to Mark Benecke, Michel Perrier and Reidun Sognaes, Reidar's daughter, for their kindest help.

Mark Benecke, Reidun Sognaes and Bundesarchiv Berlin supplied pictures.

²³ Reidun Sognaes, 2006, © Sognaes; American Board of Forensic Odontology, 2006.

²⁴ Reidun Sognaes, Personal communication, 2006.

²⁵ ABFO, op cit., fn. 22.

²⁶ Sognaes, op cit., fn. 24.

²⁷ Perrier, op cit., fn. 17.

²⁸ Wilhelm Schulz, *Zur Organisation und Durchführung der zahnmedizinischen Versorgung durch die Waffen-SS in den Konzentrationslagern während der Zeit des Nationalsozialismus* [Organisation of the SS dentistry in Nazis concentration camps], Dissertation, Bonn: University of Bonn, 1989.

²⁹ Bundesarchiv Berlin, 2004, © Bundesarchiv Berlin.

³⁰ Riaud Xavier, *Les dentistes allemands sous le III^{ème} Reich* [German dentists under the 3rd Reich], L'Harmattan (éd.), Collection Allemagne d'hier et d'aujourd'hui [Yesterday and today's Germany Collection], Paris, 2005.

³¹ Schulz, op.cit., fn. 28.

THANK YOU IMHOTEP – Part 2

Julie Papworth *⁺

Editor's note

Owing to a technical error the illustrations for this paper published in January 2011¹ were omitted. They follow below, with apologies to the author.

Figure 1 Bronze statue of Imhotep



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¹ J Papworth, Thank you Imhotep, *Dental Historian* 2011; 53: 37-38.

Figure 2 Portion of Edwin Smith Papyrus



Acknowledgements

Thanks are due to the Wellcome Library, London, for permission to reproduce the two figures

BRITISH 19TH CENTURY DENTISTS IN MALTA: JOHN MALLAN

George E Camilleri

John Mallan was a practising surgeon dentist at 9 Half Moon Street, Piccadilly in London. The Post Office London Directories of 1839 and 1842 list him at that address but he is omitted from the 1846 issue. He had published a book on *Practical observations on the physiology and diseases of the teeth* which was promoted in the review section of the 1835 *Metropolitan*.¹ It stated:

The author has made as much of his subject as it is capable of. It is addressed, not only to the practitioner, but also to the patient, in a clear and convincing manner, and it contains the best, and, we believe, the most disinterested advice. When we consider how much of our personal comfort, as well as appearance, depends upon our teeth, and how continually they are in requisition, too much care cannot be bestowed upon these elegant little instruments of utterance and mastication. Mr. Mallan's book is well worth buying and preserving.

Dr John Mallan came to Malta early in 1866. On his arrival he advertised in the *Malta Times*:

Dr. John Mallan Surgeon dentist from the firm of Kohl and Mallan Half Moon Str Piccadilly London and 4 Rue de la Paix Paris informs the public of this town, that visiting this Island at the special request of several families of distinction, his sojourn here will be limited. Dr. Mallan may be consulted at the Imperial Hotel, Malta, Incorruptible Artificial Teeth without wires, ligatures, or springs or gold. The artificial teeth are made on an entirely new principle, they are fused without the least pain, no extraction of roots required. They have neither wires nor ligatures, they facilitate mastication and articulation. Decayed teeth enamelled. This operation consists in transforming into their normal state, discoloured or painful teeth by means of a white enamel introduced into the cavity by which instantaneously the hardest food may be broken.

Similar to many other dentists visiting Malta for brief periods he saw the patients at his Hotel. He advertised in both the English and Italian papers. The *Portafoglio Maltese* said his stay would be brief. However in a later announcement he begged to inform the public that at the request of several families he has delayed his departure for eight days. He eventually left for Alexandria, another favourite place of call for these itinerant dentists, on the "Campidoglio" on 17 March 1866. Although Mallan assured the readers that he would revisit Malta in the following December no evidence of a return visit has been found.

THE ORIGIN OF THE DENTAL PROFESSION: DENTAL DISEASE AND DENTISTRY IN ANCIENT EGYPT

Roger Forshaw * +

From the very earliest times, humans have been plagued by dental problems, with caries for example, having been observed in skulls dating back to the Upper Palaeolithic Period, some 20,000-30,000 years ago. The ancient Egyptian civilisation, generally considered to have existed from the unification of Upper and Lower Egypt in approximately 3100 BCE to the Roman conquest in 30 BCE, was no different. In ancient Egypt the exceptionally dry climate and the unique burial customs that were practiced resulted in the survival of large numbers of well-preserved skeletal and mummified remains. Extensive visual and radiological examinations of these remains have demonstrated the many pathological and non-pathological conditions seen in the dentitions of the ancient Egyptians. Large sample sizes provided by the various archaeological surveys of Nubia (present day Sudan); extensive collections in various museums and universities, and individual examinations by many researchers have revealed a detailed picture of the dental health of these peoples. This has been further aided by information obtained from the surviving documentary and archaeological evidence.

The conclusions from these findings indicate that far from having healthy dentitions, the ancient Egyptians suffered from dental abscesses, worn teeth, and periodontal disease. Significantly, these disorders were not only experienced by the peasants, the overwhelming majority of the population, but also by the pharaohs and the elite of society. So what caused these dental problems, particularly as the ancient Egyptian is considered to have had a fairly healthy diet by present-day standards? Indeed, the power and prosperity of ancient Egypt has long been regarded as a product of one of the most successful agricultural economies of the ancient world.

The secret of Egypt's success was the river Nile along whose banks most of the population of the country lived. Not only was the Nile the life blood of Egypt providing water for drinking, irrigation and navigation but the annual flooding, the inundation, deposited a layer of alluvial silt over the land as it receded. This regular deposit of silt rejuvenated the land, permitting at least two crops a year and making Egypt one of the most productive countries in the ancient world. Unless the annual inundation failed, the ancient Egyptian would have had a reasonably balanced diet, and so it is difficult to believe that this diet could have been the main cause of the dental problems.

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¹ *Metropolitan* 1835; 13 (49): 17.

The major dental condition identified was that of excessive tooth wear, which was so widespread that it was found to a greater or lesser extent in most of the ancient Egyptian skulls throughout the time span of this civilisation. Their teeth were rapidly worn down throughout life due to the chewing of a coarse fibrous diet made even more abrasive by the presence of inorganic particles found, particularly, in the bread, their staple food. Microscopic, radiological and chemical analyses of these particles have determined that they were predominately quartz with the presence of some feldspar, mica, hornblende and other rock fragments.¹ This particulate matter which contaminated the bread would have arrived from a number of sources, such as particles from the soil where the grain was growing; from stone harvesting tools; wind would have blown in desert sand during winnowing; from the grinding of the grain, and also particles would have entered during the baking process. All this is well illustrated in the various scenes and models found in ancient Egyptian tombs.

In time this tooth wear became so extensive that the enamel and dentine layers of the tooth were worn away and the pulp chamber became exposed, resulting in necrosis of the pulpal tissue and abscess formation. Numbers of skulls show multiple abscess formation, indicative of how severe the problem of this tooth wear was. Possible later consequences of this apical infection such as cystic formation and osteomyelitis have also been observed in ancient Egyptian skulls. Indeed osteomyelitis with its frequently associated untreated bacteraemia was thought to have been responsible for many deaths in antiquity.

Periodontal disease, a disease of great antiquity was also known in ancient Egypt. However, identification of periodontal disease in archaeological specimens has to be undertaken with care, as the increase in the distance between the cemento-enamel junction and the alveolar crest, which has erroneously been used as an indicator of periodontal disease in the past, has been demonstrated as being due to continuing eruption as a result of tooth wear.² A more positive indicator is the appearance of pitting on the alveolar bone caused by the resorption of the outer cortical plate, which then reveals the underlying porous cancellous structure.³

The primary cause of periodontal disease is today known as bacterial irritation brought about by the accumulation of plaque at the dento-gingival junction, and this also seems to have been the case in ancient Egypt. Additionally, local and systemic factors are known to influence the progress of the disease and again this is likely to have been similar in antiquity. There is

paleopathological evidence of diseases such as anaemia, diabetes mellitus and tuberculosis, all of which can cause gingival destruction and bone loss.

There appears to have been little indication of an oral hygiene regime and it is likely that the deposited plaque around the cervical margins might have adhered undisturbed for a considerable period of time. Indeed, many skulls show considerable deposits of calculus. Hygiene was important to the ancient Egyptians and there is evidence that many of the population washed every day with cosmetics and perfumes being an important part of life for both sexes. However, no aid to oral hygiene has ever been discovered, although it is known that natron masticatories were employed to freshen the mouth. Priests are known to have chewed natron pellets as a purification ritual and the general population are, on occasions, thought to have done so before a meal. There is also evidence from tomb scenes and from later Classical authors that papyrus stems were chewed and spat out, all of which may have assisted, to a limited extent, the oral hygiene of the population.⁴

Possibly some form of wooden tooth pick may have been in use since it is known from other civilisations in antiquity that various implements such as chew sticks, tree twigs, birds feathers, animal bones and porcupine quills have all been used for oral hygiene purposes. In 2003 an Egyptian papyrus written in Greek and dated to the 4th century AD and which was originally discovered near the ancient Egyptian city of Crocodilopolis, was translated. It describes a 'powder for white and perfect teeth', and when mixed with saliva in the mouth, it forms a 'clean tooth paste'. The composition of the powder is listed as rock salt, dried iris flower and pepper, all of which are to be crushed and mixed together. This recipe, the earliest known for toothpaste, may well have been handed down from earlier generations and so could have originated in ancient Egypt.

Caries, as mentioned previously and similar to periodontal disease, was also known in antiquity. Although prevalent in modern society it was, however, infrequently seen in ancient Egypt due to the lack of fermentable carbohydrates in the diet coupled with the fibrous abrasive nature of the food, which tended to inhibit the retention of plaque on the tooth surface. Also tooth wear was a factor since occlusal wear would have eliminated pits and fissures, and interproximal wear would have caused flattened tooth contacts, both producing a more difficult environment for plaque and caries to proliferate.

In later periods of ancient Egyptian history caries incidence rose as increasing foreign influence resulted in changes to dietary habits, one of these being an increase in the consumption of these fermentable carbohydrates, notably fine white bread, honey and dates. These food items not previously consumed by the majority of the population now became more readily available. Interestingly, due to the nature of their diet caries was more

¹ Leek analysed in depth the wear on ancient Egypt teeth. See F F Leek, Teeth and bread in ancient Egypt, *J Egypt Archaeol* 1972; 58: 126-32; also F F Leek, Further studies concerning ancient Egyptian bread. *J Egypt Archaeol* 1972; 59: 199-204.

² N G Clarke, S E Carey, W Srikandi, R S Hirsh and P I Leppard, Periodontal disease in ancient populations, *Am J Phys Anthropol* 1986; 71: 173-183.

³ N G Clark, Periodontal defects of pulpal origin: evidence of early man, *Am J Phys Anthropol* 1990; 82: 371-376.

⁴ For a discussion on masticatories in ancient Egypt see D M Dixon, 'Masticatories in ancient Egypt', in D R Brothwell and B A Chiarelli (eds), *Population Biology of the Ancient Egyptians*, London & New York: Academic Press, 1973, pp. 433-449.

prevalent in the upper echelons of society, during most periods of pharaonic history.

These three dental disorders would have caused considerable pain and discomfort to the populace of ancient Egypt and so the question arises - was there a dedicated dental profession that the population could visit to address these problems? To consider this issue further, the evidence on the subject from resources such as human remains, medical papyri, hieroglyphic inscriptions, ancient writings and other miscellaneous source materials needs to be examined.

The evidence for operative procedures from the human remains

Evidence of operative dental surgery in the skeletal and mummified human remains from ancient Egypt, is a much debated subject in the medical literature. From the many thousands of remains that have been examined there are some rare instances where a surgical approach for the treatment of dental abscesses is claimed to have been adopted, there are only a few cases of possible prosthetic work, and some examples where an extraction may have been performed. Much has been made of these cases with some researchers suggesting that this evidence proves the existence of an operative dental profession, but equally so others have disagreed with this assumption.⁵

This debate was first initiated in 1917 when Hooton claimed he had found evidence that the ancient Egyptians had treated a dental abscess by surgical means.⁶ His examination of a mandible dating to about 2500 BCE revealed two small holes directed towards the root of a worn molar tooth, which had become abscessed following pulpal exposure (Fig 1). Because of their smooth symmetrical appearance and upward angulation, Hooton claimed these holes were artificially created. Breasted, an Egyptologist later supported this view and suggested that they could have been created by a bronze instrument in a bow drill. Certainly the bow drill was in use in ancient Egypt for carpentry and stone work, as evidenced by scenes painted on the

⁵ For proponents for the existence of operative dental surgery in ancient Egypt see P Ghalioungui, Did a dental profession exist in ancient Egypt? *Med Hist* 1971; 15: 92-4; Z Iskander, J E Harris and S Farid, Further evidence of dental prosthesis in ancient Egypt, *Ann Serv Antiq Egypte* 1979; 63: 93-122; Y Blustein, N Stern and S S Kottek, A case of prosthetic dentistry in ancient Egypt, *Bull Hist Dent* 1987; 35: 120-4; A A Chohayeb, The dental heritage of ancient Egypt, *Bull Hist Dent* 1991; 39: 65-9. Contra this suggestion see: F F Leek, The practice of dentistry in ancient Egypt, *J Egypt Archaeol* 1967; 53: 51-8; W Hoffman-Axthelm, Is the practice of dentistry in ancient Egypt an archaeological fact? *Bull Hist Dent* 1979; 27: 71-8; J Miller, An appraisal of the skulls and dentition of ancient Egyptians, highlighting the pathology and speculating on the influence of diet and environment, Oxford: Archaeopress, 2008; R J Forshaw, Dental practice in ancient Egypt, *Br Dent J* 2009; 206: 481-6.

⁶ E A Hooton, Oral surgery in Egypt during the Old Empire, *Harvard African Stud* 1917; 1: 29-32.

walls of various ancient Egyptian tombs depicting these activities. This debate has been furthered by one or two other similar examples having been reported, such as the case of another ancient Egyptian mandible dating to about 1500 BCE having similar holes which is shown in Malvin Ring's *'Dentistry: An Illustrated History'*.⁷

Figure 1 Ancient Egyptian mandible, approximately 2,500 BCE



However, certain arguments against this type of surgical intervention have been put forward by other researchers. One such contention is that for such treatments to have occurred, an awareness by the ancient Egyptians of the process and pathological anatomy of apical periodontitis would be required, a suggestion which would seem unlikely.⁸ Also, that perhaps Hooton's conclusion was based on the dental techniques and understanding existing in the early part of the 20th century. Then it was not uncommon to treat dental abscesses by a similar procedure known as 'apical airing', a practice long since discontinued. As the holes do not appear to be too cylindrical in shape it is possible that they were the result of a normal pathological process caused by the dissolution of bone by pus.

The question of whether dental prosthetic devices were used in ancient Egypt is a difficult subject to address due to the very limited nature of the evidence upon which to base a judgement. The earliest known, of only three appliances, was found at Giza near Cairo in a burial shaft dating to about

⁷ M E Ring, *Dentistry: an illustrated history*, New York: Harry N. Abrahams, 1985.

⁸ T Nickol, R Germer, S Lieberenz and W Wilke, An Examination of the dental state of an Egyptian mummy by means of computer tomography: a contribution to dentistry in ancient Egypt, *Bull Hist Dent* 1995; 43: 105-12.

2500 BCEE. It consists of a fine gold wire connecting a mandibular second molar to a worn third molar, and importantly was not found attached to a skull but unearthed amongst the rubble of the tomb shaft (Fig 2). The German dental report of 1927 concluded that because the teeth had a similar colour and morphological pattern, they belonged to the same individual. It has since been asserted in later literature discussing this topic that the original report claimed that the presence of calculus deposited on the teeth and wire was an indication that the appliance had been worn during life.

Figure 2 Giza bridge, (Roemer und Pelizaeus Museum, Hildesheim)



However, the heavy tooth wear has produced such a considerable change in the tooth form that it is impossible to say that the teeth belonged to the same individual. Additionally, a more recent translation of the original German dental report indicates that calculus was only found on the teeth and not the wire. This incorrect translation has often been quoted in subsequent publications. Another factor is that the deposits on the teeth might not be calculus but concretions of extraneous matter formed over a period of some 4,500 years. Only a microscopic examination could determine the difference, a procedure that was not carried out at the time and due to subsequent damage to the appliance during the Second World War is now no longer possible.

A more probable explanation is that the device was inserted after death in an attempt to make the body whole for the afterlife, a practice common in ancient Egypt. Alternatively, it is possible that the device could have been worn as an amulet or charm during life. Another appliance, also not found attached to a skull and similarly dated to about 2500 BCE, was unearthed at El-Quatta, 40 km North West of Cairo. This specimen consists of a maxillary right canine around which a double strand of gold wire had been encircled finishing in a knot on its distal surface (Fig 3). Separate from this are a

central and a lateral incisor connected to each other with similar gold wire, but at one time considered to have been attached to the right canine by a hook in the wire. The central incisor has a hole drilled in a mesial distal direction as the wire. The central incisor also has a labial groove on the crown in order to accommodate the gold wire passing through and around the clinical crown. The lateral incisor also has gold wire wrapped around it, which rests in a prepared labial groove and the roots of both teeth are scraped and polished producing an artificial morphology.³ The suggestion is that the canine is the right abutment of a four unit bridge with the central and lateral incisors being the pontics, and a missing left central incisor the left abutment. Because calculus was found on the lateral incisor and canine, it was claimed that the bridge was worn for a relatively long period of time during life.

Figure 3 El Quatta bridge (Egyptian Museum, Cairo)



However, the presence of calculus on the roots of the teeth could indicate periodontal involvement during life, whilst the alteration to the roots does not appear sufficiently extensive to suggest it being a conventional bridge. Also it is questionable whether the gold connecting wire would have been sturdy enough to stabilise the teeth during the normal rigours of mastication. Again perhaps a more likely alternative is a post-mortem attempt at restoring the body in preparation for the afterlife.

Only one other appliance has so far been discovered; a device excavated at Tura el-Asmant, 11 km south of Cairo, and dated to the Greek (Ptolemaic) period of ancient Egypt (332-30 BCE). Importantly, this example was found attached to the teeth in the skull, the only one from ancient Egypt to be found in situ. The appliance was described as a bridge whose single pontic was a right maxillary central incisor and was fixed into place by a silver wire passing through two holes that had been drilled mesio-distally through the crown of the tooth. Radiographs indicate no evidence of a radiolucent area above the pontic as well as a much shorter root, suggesting that the tooth being used as the pontic had been prepared outside the body before insertion. The recontouring of the labial alveolar bone also pointed to the tooth being placed

in situ after healing, and the angulation of the drill hole would probably exclude the possibility of this procedure being carried out in the mouth.

This then would appear to be a true prosthetic device, and dating to the Ptolemaic period, the earliest one discovered from ancient Egypt. However, this period was a time of trade and cultural exchange in the Mediterranean and because of the lack of similar finds in Egypt there is the possibility that the bridge may have been from a foreign traveller or that this particular technique had been imported. Certainly dental work of a similar nature has been discovered in Sidon, Greece and in Etruscan cemeteries.

It is not clear if extractions were performed in ancient Egypt since although there is considerable evidence of ante-mortem loss of teeth; many of these teeth appear to have been periodontally involved and may therefore have been removed by simple digital pressure or displaced naturally. The medical papyri are silent on the topic and no ancient Egyptian instrument has ever been identified as being used for the extraction of teeth.

One case which has been suggested by some authors as evidence to support the theory of dental extractions in ancient Egypt is that of the pharaoh Merenptah. He was the 13th son and successor of Ramesses II (Ramesses the Great), who ruled Egypt between approximately 1213-1203 BCE. A cephalogram radiograph shows the maxillary molars and some of the premolar teeth as being absent. However Merenptah was elderly when he died and the extreme loss of bony support of the remaining dentition supports the view that he suffered from severe periodontal disease. The missing teeth would have probably been exfoliated or merely removed using simple digital pressure by Merenptah himself.

However, the appearance and features of bone in certain skulls where there are missing teeth has suggested to some researchers that extractions did occur, although these are rare instances.⁹ Nevertheless, there are many examples of skulls excavated from Egyptian cemeteries possessing periodontally involved and carious teeth which have caused extensive tissue destruction, and which could easily have been removed by a simple procedure, but have been left in situ. This seems rather perplexing when one considers the sophistication of the ancient Egyptian civilisation, their extensive knowledge of medicine, and indeed the painful nature of the condition itself.

There are probably no instruments so far excavated which can be definitely considered to have been used for dental purposes, but one problem in identifying any such instruments is the fact that they are never engraved with their purpose. One possible piece of evidence for dental instruments is a large scene inscribed on one of the walls of the ancient Egyptian temple at Kom-Ombo built during the Greco-Roman era (Fig 4). Here there is what appears to be a collection of nearly 40 surgical implements. Although different interpretations have been suggested as to their purpose, it is notable that many of the items shown are contemporary with well authenticated depictions of Roman and Greek surgical instruments. Among this collection are thought to be examples of dental forceps.

⁹ J J Quenouille. *La bouche et les dents dans l'antiquité Egyptienne*. Doctorat en chirurgie dentaire thesis, Lyon University, 1975.

Figure 4 Instruments carved on wall of temple at Kom Ombo



The dentists

Translation of hieroglyphic inscriptions has produced evidence for the existence of over one hundred and fifty named or unnamed persons in ancient Egypt who are recorded as being medical personnel. Of these only nine are recognised as dentists. They appear to have been hierarchically ordered with two basic categories 'one who is concerned with teeth' usually regarded as a dentist, and 'one who deals with teeth'. It is not certain how these two titles differ, but possibly they reflect differences in duties and status. In addition

there were 'Chiefs of Dentists' and perhaps the highest dental position was that of 'Chief Dentist of the Palace'.¹⁰

The earliest named dentist, not only in Egypt but also in the world, was Hesyre, who is evidenced from six finely carved wooden panels found in his large tomb at Saqqara, which has been dated to approximately 2600 BCE (Fig 5). He bore the title 'chief of dentists and physicians' and although there is no mention of dentistry before this time, the fact that he is listed as chief of dentists perhaps suggests an already established profession. Hesyre was not only a dentist but was also a member of the king's inner circle, holding the elite title of 'overseer of the royal scribes', a title which has been likened to being head of the civil service. In addition he possessed more than twelve titles being a combination of religious and civil offices, all demonstrating the importance of his high position.

It is difficult to comprehend how Hesyre could have combined his various religious and administrative posts with the practice of medicine and dentistry. However, it is interesting that his medical and dental titles appear at the top of the title list, and it is usually accepted that in ancient Egypt the higher the title in the ranking order the more important was the particular title and occupation. Nunn suggests that perhaps Hesyre was a doctor and dentist first and then later achieved other important posts at the court, but he remained sufficiently proud of his original medical qualifications to place them first on his commemorative panels.¹¹

Other ancient Egyptian dentists similarly held multiple titles such as Nyanksekhmet who was also a 'chief of physicians' and Khuwy who was not only a dentist, but 'elder of the physicians of the palace' and in addition was recorded as specialising in gastrointestinal complaints. Whether these multiple titles indicated that the individual was engaged in several specialities or that the titles were perhaps administrative or honorary is unclear, but overall they do suggest a requirement for dental care.

However, the title of dentist disappeared after about 2200 BCE other than one isolated example some 1500 years later. It is possible that the translation of the title, which depends on accepting the hieroglyphic sign for a tusk of an animal as a human tooth may be inaccurate. Also the few possible examples of dentists have been found around the capital city and near to the royal court and so it is possible that these individuals were involved with caring for the dentition of the pharaoh. One suggestion put forward is that they may have been merely involved with cleaning the teeth of the ruler.¹²

¹⁰ K R Weeks, Ancient Egyptian dentistry, in J E Harris, EF Wente (eds) *An x-ray atlas of the royal mummies*, Chicago & London: University of Chicago Press, 1980, pp 99-121.

¹¹ J F Nunn, *Ancient Egyptian medicine*, London: British Museum Press, 1997.

¹² W Hoffman-Axthelm, Is the practice of dentistry in ancient Egypt an archaeological fact? *Bull Hist Dent* 1979; 27: 71-8.

Figure 5 Wooden panel of Hesyre



The written word: the Medical Papyri

Perhaps the most important source of information about dental care in ancient Egypt is to be found in the approximately twelve medical papyri, which are equivalent to our medical text books. Although they are silent on all operative aspects of dental care, four (Ebers, Kahun, Berlin and Hearst) include prescriptions for the treatment of dental problems. A fifth papyrus (Edwin Smith) provides instructions for dealing with fractures and dislocations

of the mandible and maxilla. The remedies in the papyri do present problems, since in a number of cases we are not certain of the exact translation of their terms for herbs and drugs and so it is not always possible to judge the effectiveness of a particular pharmaceutical remedy.

Of the approximately eighteen cases in the papyri relating to prescriptions for disorders of the teeth and oral cavity, seven are designed to prevent tooth loss by packing various materials in paste form around the tooth and the surrounding gums. The theory seems to have been that these would harden and serve as a temporary means of stabilising teeth that were mobile, presumably due to periodontal disease. These seven remedies use words such as 'set in place', 'make strong', 'if it wants to fall to the ground' - all these wordings seem to imply a mobile tooth, and are fairly similar. An example of such a prescription is Papyrus Ebers 739.¹³

Beginning of the remedies to consolidate a tooth; Flour of emmer seeds; ochre; honey; made into a mass; and the tooth to be fattened therewith.

Emmer wheat used in this prescription is not known to have any pharmacological action, but ochres, which are iron oxides, do have recognised astringent and antiseptic properties and even today are used medicinally by the Andaman tribes who live off the coast of Bengal. Honey is used in more Egyptian medicines than any other ingredient and because of its hypertonicity kills micro-organisms by drawing water out of them through osmosis. Thus honey would have inhibited bacterial growth and helped reduce inflammation in infected gingival and mucosal areas. Such a prescription would have reduced inflammation in the tissues surrounding the teeth, resulting in some pain relief, and in addition the material would have helped to splint the mobile teeth. However, only the symptoms of the disease process were being treated and not the source.

Some authors have suggested that this prescriptive agent was used as a filling material rather than being applied externally to the tooth. However, a more recent translation of the hieroglyphs as well as the unsuitability of honey, a cariogenic agent, as a filling material, and the weakness of the material itself would tend to suggest that is unlikely.

The second main group of prescriptions appears to be designed to treat various ulcers, abscesses and gum infections. An example of such a remedy, seemingly used as a mouthwash, is Ebers 745 whose components are bran together with sweet beer as the vehicle, and what is thought possibly to be the herb cinquefoil.¹⁴ Cinquefoil is used by herbalists for alleviating the pain of a toothache; it is used as an herbal gargle for treating oral sores, and has general disinfectant and astringent properties. So as with Ebers 739, mentioned above, there seem to be a rational approach to the problem, with some attempt to provide treatment.¹⁵

Also listed in the Ebers papyrus is prescription 742:¹⁶ "Another, for the treatment of a tooth that is eating in the opening of the flesh: cumin; terebinth;

carob; to be made into a powder and applied to the teeth." It is not certain what is meant by "eating in the opening of the flesh" although it is often considered to be a dental abscess. Looking at the components of the prescription, cumin has antiseptic and local anaesthetic properties, whilst terebinth resin, as previously mentioned, is an antiseptic. Carob is a stabiliser and in addition possesses astringent and demulsifying properties. Consequently, such a material would be soothing and with antiseptic and astringent properties would provide some limited relief.

Three prescriptions deal with oral pain and one of these listed in the Berlin medical papyrus (75) seems to suggest an inhalation technique.¹⁷

Smoke of 12 pieces of incense which one makes for one who suffers toothache as a result of the wxdw. Willow leaves (and) dry leaves of the Sams-plant, to be finely ground in liquid and to be sprinkled with sweet beer; the man is to be fumigated with it and anointed.

Unfortunately, this prescription is not fully understood, particularly as the meaning of wxdw is far from certain, although it has been suggested that it could indicate pus, and in which case the prescription could refer to the treatment of an abscess. Similarly, the translation of Sams-plant is uncertain, but it is thought to be possibly willow. Willow bark contains salicin, a chemical similar to acetylsalicylic acid and therefore has analgesic and anti-inflammatory effects. So this prescription does suggest, perhaps, an attempt to relieve pain.

Apart from the dental prescriptions the Ebers papyrus also contains four remedies (701-704) aimed at "expelling illness in the tongue".¹⁸ There is no further explanation of what this particular condition is but the remedies listed are predominately mouth washes. Their constituents are compounds such as honey and yellow ochre described above, as well as milk which has soothing properties. Other ingredients are celery seeds which have anaesthetic properties, and acacia juice which is a demulcent. It is difficult to speculate as to what the condition these prescriptions were attempting to treat, but perhaps an ulcer, a burn, or trauma from a sharp tooth are possibilities.

The other remaining medical papyrus of dental and medical interest, the Edwin Smith Papyrus dates to about 1550 BCE and is a well written and sophisticated example of medical literature.¹⁹ It is the earliest known treatise dealing with surgery and describes forty-eight cases which are mainly treatments for the relief of trauma. It has a logical approach being an 'instruction book' rather than a simple compilation of remedies, and the accuracy of observation, organisation and degree of knowledge demonstrated in the papyrus is outstanding. Being such a rational document it has been suggested that it was written by a surgeon possibly familiar with traumatic injuries from experience gained perhaps in the military theatre or from major

¹³ W Wreszinski, *Der Papyrus Ebers*, 1 Teil: Umschrift, Leipzig: Hinrichs, 1912.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ W Wreszinski, *Der Grosse Medizinische Papyrus des Berliner Museums*, Leipzig: Hinrichs, 1909.

¹⁸ Wreszinski, op cit., fn. 13.

¹⁹ J H Breasted, *The Edwin Smith surgical papyrus*, Chicago: Chicago University Press, 1930, 2 vols.

building projects, such as the construction of the pyramids. Amongst them there are several cases relating to oral and maxillofacial surgery but none specifically relating to teeth.

However, case 25 provides instructions for correcting a dislocated mandible. It shows a clear reasoned approach differing little from the method that is practiced today and is the earliest description of a surgical procedure still in use.²⁰

Instructions concerning the dislocation in his mandible: If you examine a man having a dislocation in his mandible [and] you find his mouth open [and] cannot close it for him, you should place your thumbs upon the ends of the two rami in the inside of this mouth [and] your two groups of fingers under his chin, and you should cause them to fall back so that they rest in their place.

Also of note is that the Edwin Smith papyrus contains the first recorded use of absorbent lint made from vegetable fibre whilst splints and bandages are routinely used. It describes the use of adhesive strips, prepared from linen strips soaked in resin, for dealing with wounds, and cases of complex suturing are described in detail. It is clear from this papyrus that surgery was known, understood and practiced in ancient Egypt and that some of this knowledge is still in use today.

In ancient Egypt magic had an important role to play, with supernatural influences regarded as major controlling factors in the events of every day existence. These included not only phenomena such as the movement of celestial bodies and the annual flooding of the Nile, but they were also considered an integral part in the causation and treatment of disease. Indeed belief in the supernatural origin of certain diseases continued after the demise of the ancient Egyptian civilisation and was prevalent in Europe for many centuries.

Although the ancient Egyptians were intelligent observers and discovered empirically some effective drugs and rational healing methods, magic undoubtedly had a part to play. There are cases where the use of ritual and magical spells is suggested as a sole remedy, and in other instances 'magical' and 'rational' treatments are linked, with the two methodologies being complementary to each other.²¹ It would seem that the majority of the dental prescriptions fitted into the rational scenario, with many of the components having a recognised pharmacological action and there appears to be no associated incantation. However, there are known to be general spells for the treatment of ailments and so it possible that these may have been used.

²⁰ Breasted. op cit., fn. 19.

²¹ R K Ritner. Magic in Medicine. In D B Redford (ed) *The Oxford encyclopedia of ancient Egypt*, vol 2. pp 326-329. Oxford: Oxford University Press, 2001.

Later sources

There are references to Egyptian medicine and dentistry in texts of other Near Eastern societies, as well as those from Greece, Rome and medieval Europe. One example is that of Herodotus, a Greek traveller and historian, who visited Egypt in about 440 BCE. He later wrote an account of the country and its history, and in this record he included details of specialisation in the medical profession.²²

The practice of medicine they split into separate parts, each doctor being responsible for the treatment of only one disease. There are, in consequence, innumerable doctors, some specialising in diseases of the eye, others of the head, others of the teeth, others of the stomach, and so on.

Whilst it may be wrong to interpret this passage with the view that medical knowledge was so advanced in ancient Egypt that specialisation was necessary, much as occurs today in the modern world, it does nevertheless imply that some form of dental care did exist.

Other miscellaneous source materials

There appears to be little indication of dental diseases and dentistry from any of the other surviving archaeological evidence from ancient Egypt. There are no depictions of the ancient Egyptians appearing to suffer from toothache or receiving dental treatment in the various surviving artistic representations, nothing comparable with the Byzantine and late-medieval illustrations showing teeth being extracted.

Perhaps one of the most significant pieces of evidence concerning dental disease and dental care in ancient Egypt comes from a study of the dentitions of some of Egypt's most important rulers. In the late 1960's the Royal mummies in the Egyptian museum in Cairo were radiographed. Several of the most celebrated pharaohs such as Amenhotep III and Ramesses II demonstrated dental conditions involving extensive tooth wear, dental abscesses and advanced periodontal disease²³ (Fig 6). These disorders must have caused considerable pain, which will undoubtedly have had some bearing on the quality of life of the particular pharaoh, yet nowhere was there evidence of any form of dental treatment. If anyone in ancient Egypt was to receive such treatment surely it would have been these powerful rulers, and this must undoubtedly point to a lack of, or a very limited provision of any such care.

²² Herodotus, *The histories* [Trans, A de Sélincourt, London: Penguin, 1972, Revised ed.

²³ J E Harris, A T Storey and P V Ponitz, Dental disease in the royal mummies, In J E Harris and E F Wente (eds), *An x-ray atlas of the royal mummies*, pp 328-345, Chicago & London: University of Chicago Press, 1980.

Conclusion

The evidence suggests operative dental treatment in ancient Egypt, if it did exist at all, was very limited. The management of dental conditions seems to have been restricted to the type of pharmaceutical preparation listed in the medical papyri which were either applied to the gingival and mucosal tissues or used as mouthwashes. These remedies were directed towards the symptoms of the problem, rather than the cause, and at best will only have provided some short term relief.

To conclude, it seems many Egyptians would have experienced painful dental disease which the available treatments of the day would have done little to alleviate.

ORAL AND MAXILLOFACIAL SURGERY AT THE LONDON HOSPITAL (1857-1990)

Stanley Gelbier*[†]

A hospital and medical school

On 3 October this year the London Hospital Dental School celebrates its 100th anniversary. An updated full history by the author is being published elsewhere. This paper examines developments in oral and maxillofacial surgery.

In September 1740 The London Infirmary (renamed London Hospital in 1748) was founded to treat sick poor people, merchant seaman and the East End 'manufacturing classes'. Its Medical College followed in 1785 as England's first medical school.

Some patients had severe conditions, including tuberculosis, with oro-facial manifestations. Local factories had workers with arsenic and mercury intoxication, 'phossy jaw' (at a matchbox factory) and lead lines on their gums (accumulator factory). People had severe decay, oral sepsis and abscesses and some died from poor treatment, but no dentists at the London provided care.

Appointment of staff

After much pressure Henry J Barrett MRCS was appointed by the hospital as a surgeon-dentist on 9 June 1857. In 1874 H Barrett was replaced by A W Barrett. The latter was succeeded in 1896 by William Dolamore MRCS LRCP LDS and George Cunningham DDS (Harvard) LDS. Within three years the latter was succeeded (now as a dental surgeon) by Francis Farmer LDS. Dolamore resigned in 1907, leaving Farmer to act alone. Within three years he developed ideas for a dental school, the London Hospital Medical College Dental School opening on 3 October 1911.

On 20 July 1911 a committee of the Medical Council recommended the appointment of George Northcroft DDS LDS, G Paton Pollitt DDS LDS, J Sim Wallace MD DSc LDS, Francis Farmer LDS, Harold Chapman DDS LDS and Evelyn C Sprawson LDS MRCS LRCP as surgeon-dentists, to attend one day each. None were paid until 1920. Just afterwards the first lecturers were appointed (Fig 1). All the dentists had an LDSRCS; three possessed an American DDS degree. Sprawson was dental surgeon to Dr Barnardo's Homes. The early dentists were mainly tooth extractors. True oral surgery came later.

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Sir Francis Farmer LDS

The World Wars forced many dentists as well as surgeons to perform life saving and other brilliant surgery. Farmer was knighted in October 1915 for his work in repairing facial injuries. Sprawson was awarded an MC for gallantry in the field. The work of maxillofacial surgeons in World War 2 ensured the inclusion of this field of activity in 1948, in the new National Health Service.

Figure 1 The first Lecturers

Name	Subject taught
Wallace MD DSc LDS	Dental Surgery and Pathology
Northcroft DDS Mich LDS	Operative Dental Surgery
Farmer LDS	Dental Prosthetics
Pollitt DDS Penn LDS	Operative Dental Surgery
Chapman DDS Penn LDS	Odonto-prosopic Orthopaedics
Sprawson MRCS LRCP LDS	Dental Histology
William Wright MB DSc FRCS	Dental Anatomy
William Bulloch MD	Dental Bacteriology
Otto Grunbaum MD DSc FRCP	Dental Materia Medica
H Candy BA BSc	Dental Metallurgy (theoretical and practical)
RJ Probyn-Williams	Instructor in Anaesthetics
MB MD MRCS LRCP	

George Trevor Hankey FRCS LRCP LDSRCS

In 1928 George Hankey, who had qualified as a doctor and a dentist in 1922, was appointed assistant dental surgeon at the London Hospital and lecturer in oral surgery and radiography at the College. At the same time he developed a private practice. Hankey was one of the first people to be elected to the new FDSRCS in 1948. In 1938 he gave a lecture at the Royal Society of Medicine on osteomyelitis of the jaws.

During World War II Hankey was in command of the Army's Field Ambulance. He was captured by the Germans on retreat to the Dunkirk beaches and became a prisoner-of-war. With him was Ron Fearnhead, his orderly in the camp. Fearnhead later became professor of dental anatomy at the London. In the camp Hankey provided medical care for prisoners. During the Blitz on London his private practice was bombed and his wife was killed. Post-war, Lieutenant-Colonel Hankey was awarded an OBE and the American Legion of Merit.

Upon release from imprisonment and demob from the Army Hankey started up another practice and found a new wife. He was appointed honorary dental surgeon to the London and, in 1948, when the National Health Service started, he became a consultant dental surgeon.

Hankey pioneered Moose mandibular ramus and body osteotomies and temporomandibular surgery. His other clinical interests included extraction of impacted teeth, diagnosis and removal of cysts and benign tumours.

In 1953 Hankey was the Charles Tomes Lecturer at the Royal College of Surgeons of England, followed in 1962 by the award of its John Tomes Medal. In the same year he was an inaugural member of the council of the British Association of Oral Surgeons, becoming president in 1963. In 1964 he was awarded the FRCS.

Sydney George Allen MRCS LRCP FDS

In 1920 Sydney George Allen (known as 'SG') joined the London's dental course at 16 years of age. He completed the course on time but was precluded by the Royal College of Surgeons' regulations from being awarded his LDS until the age of 21. 'SG' gained his medical qualifications in 1936. He was amongst the first to be awarded the new FDS in 1948.

At one time 'SG' was honorary dental clinical assistant to the London's Radiology Department. In 1937 he became assistant dental surgeon at the hospital. By 1941 'SG' was honorary dental surgeon to the London Emergency Medical Service at Brentwood Hospital, the London's annexe. There he pioneered the treatment of oral cancer with intra-oral radium applicators and constructing ingenious prosthetic appliances from consultant radiologist Walter Shanks.

'SG' then joined the Royal Naval Volunteer Reserve as a medical surgeon-lieutenant, where he remained for 2½ years. He served on the merchant cruiser HMS Brillo, the combined operations HQ ship, in Algiers, Sicily, Angir and Normandy. There the ship was damaged by bombs. 'SG' also became a temporary lieutenant in the Royal Army Dental Corps.

After the war 'SG' returned to the London Hospital and rebuilt his West End practice. He lectured in children's dentistry, became consultant oral surgeon and was consultant to the nursing staff.

Working with the neurosurgeon Jack Crawford, 'SG' was one of the first people to construct acrylic cranial implants, taking impressions of the bony edges with sterilised Plaster of Paris. He removed impacted teeth, cysts, benign tumours and treated osteomyelitis.

'SG' researched lead in children's enamel with Dr EW Berry and tried to establish a connection between oral organisms and gastric ulcers with Dr Michael Vaizey.

Arthur G Allen MRCS LRCP LDS and William R Keizer MRCS LRCP LDS

Other dental surgeons were Arthur G ('AG') Allen (appointed 1926) and William Keizer (1931), both later gaining the FDS. They had weekly operating lists to remove impacted wisdom teeth and cysts. Keizer researched the similarities between epithelial tumours of the pituitary body, adamantinoma,

and basal-celled carcinomata.

**Professor Gordon Robert Seward CBE MDS MBBS FRCS
FDS Edin & Eng FFARCS**

It was with Seward (Fig 2) that academic surgery came into its own. After schooling at Hackney Downs Grammar School Seward entered the London Hospital in October 1944. In 1948 he gained the LDSRCS and BDS (Honours), following with an FDS in 1957. In 1953 Seward and John Pedler were the first persons to gain the MDS degree from the University of London. After qualification there were a series of medical and dental appointments, at the London Hospital unless indicated:

- 1948 Non-resident dental house surgeon
- 1948 Resident dental HS.

Seward then went into the Army as a national serviceman (1948-50), first as a Lieutenant then a Captain in the Royal Army Dental Corps. He served at the Connaught Hospital, Hindhead Sanatorium and HM Hospital Ship *El Nil*. After demob he served in the Territorial Army (1950-54), as a Dental Officer to No 167 (City of London) Field Ambulance (TA).

In 1956 Seward was part-time locum consultant dental surgeon at the North Middlesex Hospital. He then decided to gain further surgical experience:

- 1957 Junior HS to Surgical Unit
- 1958 Senior HS to Surgical Unit.

Seward's posts with surgery brought him into contact with W T Irvine, Reader in Surgery. He taught him a great deal and allowed Seward to do surgery on parotid ducts for stones. There followed:

- 1958 Senior HS to Medical Unit
- 1958 Recovery Room officer (A&E)
- 1950-53 Registrar to the Dental Department
- 1958-59 Senior Dental Registrar

Seward spent periods in other departments. In 1959 he joined Norman Rowe at Queen Mary's Hospital for six weeks. In the next year he spent six weeks at Mount Vernon Hospital. In the spring of 1967 he spent four weeks with Professor Hugo Obwegeser in Zurich, Switzerland. In the winter he went to the USA; to the Henry Ford Hospital, Detroit and Ann Arbor dental school. In 1974 some experience of plastic surgery was gained with JSP Wilson at the Westminster Hospital.

In 1959 Seward was appointed as the first full-time lecturer in oral surgery, becoming reader/honorary consultant in 1962. Six years later he was appointed by the University of London as the London Hospital Medical College's first professor of oral surgery; and at the same time became honorary consultant dental surgeon to the London Hospital. In 1990 Seward's title was amended by the university to oral and maxillofacial surgery to reflect his growing expertise and increasing recognition as an international figure.

Figure 2 Professor Gordon Seward



Seward was Dental Dean of the London (1975-9) and Dean of the Dental Faculty of the English surgical college (1986-89). Amongst his awards were, in 1979, the Down's Surgical Prize and Silver Medal of the British Association of Oral and Maxillofacial Surgeons. By the time retirement approached a number of additional honours were bestowed. In 1986 he was awarded an FRCS by the Edinburgh Royal College of Surgeons followed in 1987 by one from the English college. In 1988 he was awarded an honorary Fellowship by the Faculty of Anaesthetists of the Royal College of Surgeons of England, acknowledging his support for the investigation into the administration of general anaesthetics in dental practice. In 1991 there followed the Colyer Gold Medal of the Royal College of Surgeons of England and the Tomes medal of the BDA and in

1996 the Geoffrey Slack Medal of the London Hospital Medical College and the Jordan University Medal. In 2005 he became an honorary member of the BDA.

After retirement in 1990 Seward was appointed consulting oral and maxillofacial surgeon to the Royal London Hospital and emeritus-professor of oral and maxillofacial surgery by the University of London.

Over the years Seward contributed to the literature many academic papers. One which drew much general interest was on the famous 'Elephant man', who resided for some time at the London Hospital.¹

Seward's illustrious career was crowned by the award of a CBE in the 1990 Queen's Birthday Honours list.

The Department of Oral and Maxillofacial Surgery

In 1960 the Department of Oral Surgery was in the Medical College. It was later re-named the Department of Oral and Maxillofacial Surgery. The main

¹ G R Seward, The Proteus syndrome: the Elephant Man diagnosed, *Br Med J* (Clin Res Ed) 1986; 293 (6559): 1435.

focus was on teaching and research in the College. The consultants and registrars in the hospital were separate from the university staff.

Professor David McGowan BDS PhD MDS FDS FFD

When SG Allen retired from his part-time sessions it released money towards a whole time lectureship to which David Alexander McGowan (Fig 3) was appointed in 1968. An Ulsterman, he studied dentistry at Queen's University, Belfast, from where he later gained an MDS. McGowan was promoted to Senior lecturer and then SL/honorary consultant at the London and was the first Senior Tutor. He carried out research for a PhD, which was awarded in 1978. In 1977 McGowan left to become Professor of Oral Surgery and subsequently Dean of Glasgow Dental School, and of the Dental Faculty of the R.C.P.S. Glasgow.

Figure 3 Prof David McGowan



Hugh Cannell MSc MRCS LRCP FDS was a later lecturer, SL and reader/honorary consultant. At appointment he already had an MSc Wales, gained in 1971. At the London he was awarded an MD in 1977.

Anne Aiken BDS FDS Edin DOrth was another lecturer, then SL/honorary consultant. Her PhD came in 1988.

Part-time NHS consultant oral surgeons in Seward's time included Patrick James FDS FRCS Edin LRCP and Terence English BDS MB BCh FDS FFD. James was interested in osteotomies, treatment of cancers with neck flaps, temporomandibular joint disorders.

There were also three part-time lecturers. In addition, Mrs Rita Mason² was tutor in dental maxillofacial radiography. Her research interest was in the zone of

sharpness in rotational tomographic techniques. She was followed by Ms Sarah Bourne as tutor in dental radiography and superintendent radiographer.

² Daughter of Sydney Blackman, famous professor of dental radiology at the Royal Dental Hospital, London.

In 1990 Seward was succeeded by Paul Bradley, who was previously professor of oral and maxillofacial surgery in Edinburgh. But that is another story!

Acknowledgements

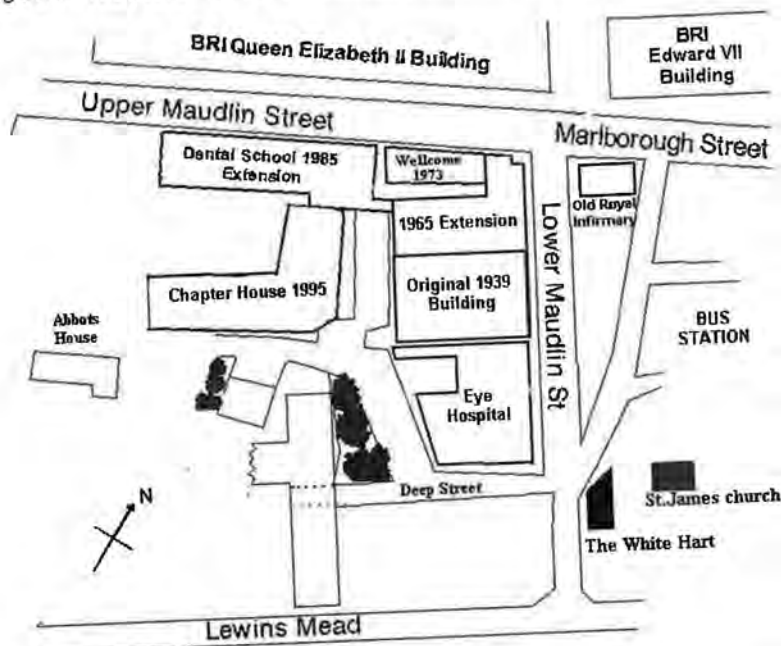
Thanks are due to Professor Gordon Seward, who provided an enormous amount of information. Also Professor David McGowan. Librarians at the BDA and archivists at the Bart's and the London Hospital Archives helped to pinpoint relevant information. Profs Seward and McGowan kindly provided the photographs.

THE BRISTOL DENTAL SCHOOL SITE*

Chris Stephens[†] and Robin Matthews[‡]

The teaching of dentistry in Bristol can be said to have begun in 1874 when the Bristol General Hospital established a post of Surgeon Dentist to which Thomas Cooke Parson was appointed. However it was not until 1939 that the University of Bristol Dental School and Hospital opened its doors on Lower Maudlin Street (Fig 1).

Figure 1 The present site of the University of Bristol Dental School and Hospital



* This is a shortened version of a chapter in a forthcoming publication, *The History of the Bristol Dental School*.

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The present dental school lies on what had originally been a flat area above a steep bank overlooking the River Frome as it flowed from the moat of the mediaeval castle through a marshy valley on its way to join the River Avon to the southwest of the city. Excavations in 1973 revealed that below the present site of the 1985 extension to the school there had been one of the earliest sites of Romano-British occupation to be discovered in Bristol. This could not be fully excavated as it continued beneath the road of Upper Maudlin Street but was dated by finds on the site to the 2nd to 4th centuries AD.¹

These excavations had been undertaken when the site to the south of Upper Maudlin Street became scheduled for redevelopment and was directed at investigating the mediaeval buildings of the religious foundation of Greyfriars (Friars Minor/Franciscans) which was known to exist there from earlier accounts.² The order of Greyfriars first came to Bristol in about 1230 AD and took their name from the plain un-dyed woollen robes they wore. Around 1250 AD a site for the order was found below the present dental school, beside Lewin's Mead³, possibly on land given by the Benedictine Priory of St James which had been built by Robert Earl of Gloucester in 1138. All of these religious establishments stood outside the city which at that time was walled and protected to the south by a marshy area at the junction of the rivers Avon and Frome.

The Greyfriars precinct was described by William Worcestre writing in 1478 as lying on the north side of Lewins mead with "walls and gardens extending up the hill". It would appear that the site was bounded St James Priory (now Lower Maudlin Street) on the east, Upper Maudlin Street on the north, Johnny Ball Lane on the west and Lewin's Mead to the south. The friary was rebuilt extensively at the end of the 14th century. Excavations in 1973, and Williams measurements of 1478 and 1480 suggest a church of overall length about 52 metres with a tower 4 metres square. There was a chapter house of 14 metres by 8 metres, (later extended to 22 metres x 8 metres) a cloister of 17 metres by 25 metres as well as the usual monastic dormitory, frater, kitchens etc.

Like all other Bristol religious houses the friary continued until the dissolution of the monasteries in 1538. Included among these was the small priory of St Mary Magdalene near the bottom of St Michael's Hill⁴. The road leading to this had become Magdalen Lane by the late 17th century and Maudlin Lane a century later (Fig 3).

A feature of all Bristol monastic establishments was the construction of reliable water supplies for themselves and for the public. Several of these have lasted into modern times.⁵ The best known is the outlet of the St John Conduit built in 1376 AD as an extension of a pre-existing conduit. This still brings water from the top of Park Street to its outlet on the north wall of the church of St John

1 M W Ponsford, *Excavations at Greyfriars Bristol*, Bristol: City of Bristol Museum and Art Gallery, 1975.

2 G E Weare, *Collectanea relating to the Friars Minor of Bristol*, Bristol: W Bennett, 1893.

3 Lewin's Mead probably takes its name from the chamberlain of Robert, 2nd Earl of Gloucester.

4 B Little, *The Story of Bristol*, Bristol: The Redcliffe Press, 1991, p 27.

5 S Watson, *Secret Underground Bristol*, Bristol: Bristol Junior Chamber, 1991, pp 104-119.

on the Wall, Nelson Street and continued to function after the city's water mains were damaged during the Second World War. The Greyfriars supply ran in a conduit from Bedford Place, Kingsdown below the site of the present Queens Building of the Royal Infirmary) to their precinct (see Figs 1 and 6).

Figure 2. The plan of Greyfriars, as revealed by the 1973 excavation, showing the line of the All Saints conduit (Copyright and courtesy of Bristol Museums, Galleries & Archives)

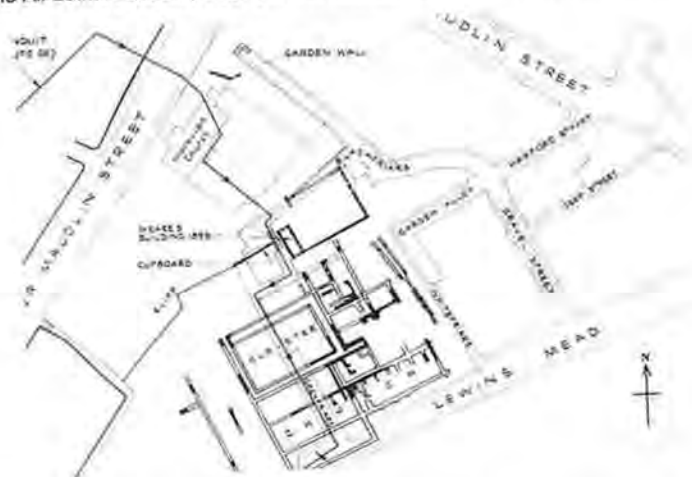


Figure 3. A section of William Miller's map of 1673 showing Lewin's Mead and Magdalen Lane later became Upper and Lower Maudlin Streets. The open area above St James church would later become the site of Bristol Infirmary. The city walls on the far side of the Frome are also clearly seen.



course (Fig 1).

Following the dissolution of the monasteries in the 16th century the estate was sold to the then Mayor and Corporation. The water supply was subsequently taken over by All Saints Parish. Part of this conduit was preserved until recent times below Upper Maudlin Street. When the site was redeveloped in 1995 the 17th century stone which marked its course was re-sited in the south east wall of the School's Chapter House (1905) above the line of its

Knowledge of the subsequent use of the Greyfriars site is incomplete. It is known that clay pipes were manufactured in the area in the 17th and 18th centuries. It seems there was also warehousing and light industry. Traces of a mediaeval building were discovered during demolition in Johnny Ball Lane in 1989. The present appropriately named Abbots House, marked in Figure 1, built to house the Bristol Royal Infirmary charity "Above and Beyond", contains a small oval window incorporated from this earlier building.

The Moravian chapel o Lower Maudlin Street

The Moravians came to Bristol in the mid-18th century. They claimed descent from a Bohemian religious group which had reformed under the patronage of Count von Zinzendorf. Unlike other non-conformist groups they had no quarrel with the Church of England but wished to promote a more actively committed Christian life. Although a group had first worshipped together in Bristol as early as 1746 it was not until a visit by Count von Zinzendorf himself in 1755 that the congregation as such became established. In 1757 the Moravians left their temporary dwellings in the Temple area of the city and moved to the more respectable site on Upper Maudlin Street. According to Dresser⁶, the Bristol Moravians, or more correctly "The Unity of the Brethren", never numbered more than 200. They shared much in common with the Quakers and Wesleyans but the Bristol Moravians were generally less affluent than Unitarian or Quakers in the city but had fewer poor and unskilled members than the Wesleyans. The most prominent of the Moravian congregation were mainly small manufacturers but at least one, Samuel Fripp, was a partner of Fry, Fripp and Company which was engaged in exporting soap.

Sexual segregation was the cornerstone of their church's organisation. Their congregation was divided into "choirs"⁷ of single sisters, single brothers, married couples, widows, and widowers. Single sisters and for a short while single brothers had a communal living and working space.⁸ The sect also practised "oeconomy" where girls were taught an occupation. For these reasons, shortly after acquiring their site on Upper Maudlin Street, the Moravians entered into protracted negotiations to purchase an adjoining estate. This allowed their later premises to include a sisters house and a brethren house for unmarried men and women.

Very little is known of the inner furnishings of the chapel but the records of John Smith and Sons, the well known Bristol Organ builders, show it had an instrument from its earliest days.⁹ The first was subsequently sold to the Moravian chapel at Gracehill, N Ireland in 1781 for £30. It was replaced in 1829 by another built by the same company. There were close links between this

6 M Dresser, Sisters and brethren: power propriety and gender among the Bristol Moravians 1746-1833, *Social History* 1996; 21: 304-329.

7 This was presumably the mediaeval use of the word choir meaning "company"

8 M Dresser, In Joseph Bethey (ed), *Historic churches and church life in Bristol*, Bristol: Bristol and Gloucestershire Archaeological Society, 2001, p 137.

9 B Whaley, John Smith and Sons of Bristol: *Worklist*, *British Institute of Organ Studies Reporter* 1999, 23 (see <http://www.npor.org.uk/Reporter/oct99/e1099.htm>).

community and the Bristol Moravians. Gracehill was founded as a Moravian settlement in 1765. A plaque on the church wall commemorates John Cennick (1718–1755), the first Moravian evangelist in mid-Antrim, who had arrived in Ballymena on 9 August 1746 from Kingswood in Bristol, where he had established a Moravian chapel five years earlier.

Figure 4 19th century rear view of the chapel showing the first school and hall on the left and the passage leading to the Minister's House on the extreme right. In the foreground there are now a large number of graves with the gravestones laid flat and all the same size as was the Moravian custom



The Bristol chapel was long involved in the anti-slavery movement. On 4 April 1759 an African prince called Gongglass visited the Moravian chapel in Maudlin Street and spoke in French to its minister. It has been suggested

he was probably one of the sons of the powerful African slave trader John Currantee of Anamaboe, in present-day Ghana.

Like so many non conformists the Moravians had their own school adjacent to the chapel and by 1870 there was a separate larger Sunday and girls' school building. This is probably because the Moravians had, from their earliest days, separated the sexes and by 1828, 68% of their congregation were women.⁶ The chapel and its buildings were by this time located in a relatively poor area of the city with much light industry. There was a cooperage on the corner of Lower Maudlin Street, although whether this was run by a member of the sect is unknown. The chapel was next to the Poor House until demolished when Upper Maudlin Street was widened in the 1880s.

A member of the congregation at this time was James Fuller Eberle (1854–1939) who was married there in 1880. He had been a school fellow of George Alfred and Henry Hubert Wills¹⁰ and was to become Alderman and later Freeman of the City as well as founder and first honorary member of Clifton Rugby Club. He notably saved the Elizabethan Bristol Red Lodge from demolition and gave it to the city and held the Order of the Russian Red Cross and was an officer of the Order of the British Empire for his humanitarian work during the First World War.

¹⁰ These were the sons of Henry Overton Wills III. It was George Alfred who in 1908 announced the donation from his father which led to the founding of the University.

Bristol had grown rapidly in the 18th century. The population was probably about 25,000 in 1700 but rose to around 50,000 by the middle of the century. The Bristol Infirmary, later the Bristol Royal Infirmary (Old Royal Infirmary shown in Fig 1), had opened to its subscribers in 1736, built on the south side of Marlborough Street. This street is named after John Churchill, first Duke of Marlborough, who played a crucial role in the war of the Spanish succession and who died in 1722. The land to the north of Maudlin Street by this time had changed from the open fields of the 17th century to formal gardens. The map of 1773 still shows Upper Maudlin Street as Maudlin Lane but its continuation, which would become Lower Maudlin Street, is at this time named Maudlin Street.

Figure 5 A map of 1815



By the late 18th century, the area of Kingsdown to the north of Maudlin Street (given as Maudlin Lane in Fig 5), where formerly the King's cavalry had performed its daily drills, was being developed as Bristol's first planned suburb. Until then this land, which had once belonged to the Benedictine priory of St James, had been appreciated as an airy, green space just beyond the crowded medieval city. Some of the roads in which these houses

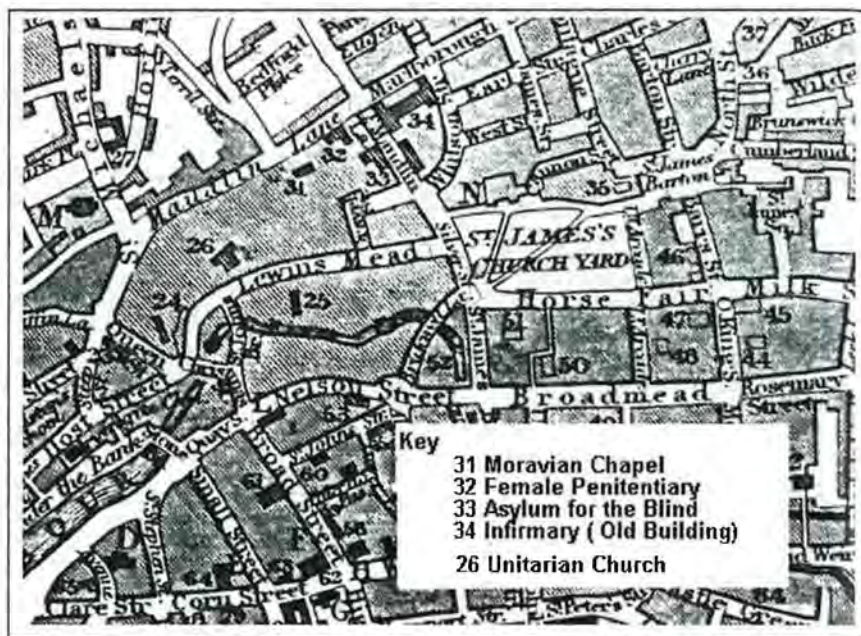
were built, such as Redcoat Lane, disappeared during the subsequent development of the BRI site in the 1970s. The map of 1815 also shows that there is now an asylum for the blind on the site where the Bristol Eye Hospital stands today. This is seen more clearly in Figure 6 and had been founded here to give blind people the means of earning their own living. In fact the Eye Hospital was already in existence at this time having been founded in 1810. In June of that year, Dr William Henry Goldwyer negotiated the rental of number 12 Lower Maudlin Street from the Blind Asylum. The same building was bought in 1839 when the asylum moved to Park Street.¹¹ This new building for the Bristol Asylum and School of Industry for the Blind occupied the site now taken up by the University's Wills Memorial Building and the City Museum and Art Gallery.

The map of 1838 also shows that a new building had appeared near the corner of Maudlin Lane and Lower Maudlin Street – a female penitentiary (marked as 32 in Fig 6). The penitentiary had been founded after a meeting on 23 April 1801 in the vestry room of St James' had considered "the possibility of

¹¹ C J G Saunders, *The United Bristol Hospitals*, Part 2, Chapter 4, Bristol: United Bristol Hospitals, 1965.

affording an asylum to those unhappy females who have been seduced from the path of virtue and may be found desirous of returning into it". By this time the parishes of St James', St Jude's and St Michael's were identified as those having the highest number of brothels and the worst problems with prostitution in the city.¹²

Figure 6 The map of 1838



Subscribers were sought, a plan was circulated and a Penitentiary was set up in Upper Maudlin Street with accommodation for about forty women. They were employed in such tasks as shoe-making, needlework and laundering and were later put into service. The time spent in the penitentiary was usually one year but could be up to two years. By this time St. James church was becoming overcrowded. In 1861 the Friends and Supporters of the Penitentiary formed a Committee to erect St James-the-Less chapel.¹³ This was designed by Pope & Bindon, well known architects of the time, who were responsible for many Bristol buildings including the completion of Bristol Cathedral. The chapel was sited next to the penitentiary. It had a distinctive domed east-end, termed a chevet. The opening service was held on 30 November 1867.

¹² Waifs and Wanderers in St Judes in The Homes of the Bristol Poor, Bristol: William Lewis and Sons, 1884 (reprinted from the Bristol Mercury).

¹³ Records of St John Diocesan Home and of its predecessors, Bristol Record Office.

Figure 7 The corner of Lower Maudlin Street site just prior to the building of the 1964 extension. St James the Less can be seen on the extreme right just past the rear of the old penitentiary building (by kind permission of Mr J C Stephenson)



The map of 1884 shows other new developments. The shops shown in Figure 7 have been built between the penitentiary and the Eye Hospital in what is now Lower Maudlin Street. The corner site of Upper and Lower Maudlin Streets has become The Prince Alfred public house, which remained there until its demolition in the 1960s to make way for the 1964 dental school extension. Route 3 of the Bristol Tramways Company now runs along Upper and Lower Maudlin Street. Horse drawn trams had been introduced 10 years earlier. In 1895 Bristol was the first city to adopt electric trams. They continued to run until the Luftwaffe's Good Friday bombing raid of 1940 destroyed the company's generating station.

The second, third and fourth Dental School extensions

The Moravian chapel's closing service was held at 3pm on Saturday 31 July 1971.¹⁴ The church of St James the Less had also closed by this time and was being used by the Church Lads Brigade. It also served as a venereal disease clinic for the Bristol Royal Infirmary until it could be relocated when the Queen Elizabeth Building (known to many as the "Phase One Building") opened in 1973. The second extension of the Dental School also opened in this year, built on the site of St James the less to provide staff offices and research laboratories for the MRC Dental Research Unit. Originally funded by the Wellcome Foundation this is still known as the Wellcome building. The 1984 third extension to the School built on the site of the Moravian chapel provided a much-needed new operative

¹⁴ Booklet reference M0005714AN, Bristol: Central Reference Library.

dental techniques laboratory, an extended and modernised dental library plus a dental materials laboratory. A 1995 fourth extension was built on the site of the former burial ground of the Moravian Chapel. The building was officially opened by Her Majesty the Queen in June of that year and named the Chapter House.

REPORTS FROM SOCIETIES

Henry Noble History of Dentistry Research Group Rufus M Ross, Chairman

Our Spring lecture held at the Royal College of Physicians and Surgeons Glasgow, on 14 March 2011 was addressed by Melanie Parker BA (Hons) on the 'The Life and Times of Sir John Tomes. It was attentively listened to by an appreciative audience. Melanie, the BDA's Museum Education Officer, is well-known to readers of *Dental Historian*. The meeting was followed by the customary sandwich lunch during which there was a most enjoyable informal exchange of views.

A great deal of time has been spent on the forthcoming Symposium to be held at the Crichton Campus of the University of Glasgow, an event being organised jointly with the Lindsay Society. Arrangements are going ahead under the direction of Professor David McGowan and a draft programme has been drawn up. Unfortunately Professor Malcolm Nicolson was unsuccessful in obtaining funding from the Wellcome Trust. However the Henry Noble Society intends to supply the necessary funding.

The working title of the Symposium has been chosen: 'Apprenticeship to Lifelong Learning: Five Centuries of Dental Education. However Prof McGowan points out there is an immense amount of preparatory work to be done by both societies.

It is hoped that information about hotel accommodation and other arrangements will be available in the near future with wide advertising via the BDJ, the Wellcome Trust, the Lindsay Society, Crichton Campus and through our own Group. As the recording of our Group Witness Seminar was highly successful Prof McGowan has asked Prof Nicolson to arrange similar recording facilities for the Symposium.

Our membership remains steady at just over sixty and the *Dental Magazine* continues to receive glowing reports. Prof McGowan has indicated he is giving up the position of editor at the end of the year but Dr Jo Cummin will continue in her present position along with an editorial panel consisting of John Craig and Rufus Ross.

The Group suffered an unwelcome blow when the Dental Hospital was flooded due to a burst water tank in the roof. The water penetrated down to the basement where we had stored a considerable amount of material, much of which was lost. Professor Moos and Pat Lilly worked hard to remove what was salvageable and arranged for storage in a number of locations.

The Lilian Lindsay Memorial Lecture 2011 Brian Williams, Hon Secretary Lilian Lindsay Society for the History of Dentistry

Each year a lecture is presented at the BDA's annual conference in memory of Lilian Lindsay, the prestigious dental historian. This year's lecture on Saturday 21 May was given by Tara Renton, Professor of Oral Surgery at King's College London Dental Institute. Her title was 'Treatment of oral pain through the ages'. In just over an hour Professor Renton gave a 'tour de force' through the millennia. She took us from Paine, the Greek Goddess of punishment and retribution, through to today's

genetic engineering. The full paper will be published in *Dental Historian* but a summary is outlined below.

Prof Renton defined pain as an unpleasant sensation, whereas anaesthesia was a lack of sensation and analgesia the absence of pain. Pain is subjective; it is personally owned and to each painful stimulus there is an individual response. There is also an emotional response where one may empathize with another's pain. Pain is a very complicated subject which even today we do not fully understand even though the search for answers started with the Greek philosopher and scientist Galen. He suggested pain travelled around the body by means of a network of 'nerves'. In the 17th century Descartes thought the pain centre was in the brain.

In the early Christian Church prayers were said to Apollonia, the patron saint of toothache sufferers. Pain was even written about by Shakespeare in 'Much ado about nothing'. But words and prayers had little effect and pain remained the scourge of mankind.

The audience was fascinated to learn that Sir Humphrey Davy discovered the soporific qualities of nitrous oxide in 1799 but it was initially only used as a recreational drug (laughing gas) with little regard for its anaesthetic properties. It was almost half a century later in 1842 when William Clarke, an American physician, anaesthetized a patient with ether to allow Elijah Pope to extract a tooth; the first time a general anaesthetic had been used for such a procedure.

Prof Renton also turned her attention to local anaesthesia, starting with the 'numbing' qualities of the Coca plant, known to the South American Indians for thousands of years. She took us through many historic anaesthetics, finally arriving at Xylocaine and Articaine.

On completion of her Memorial Lecture Professor Renton was warmly applauded by the 100+ audience. Following questions and excellent answers she was presented with an engraved glass vase and honorary membership of the Lindsay Society by Dr Stuart Robson the Society's Chairman (Fig 1).

Figure 1 Presentation to Prof Renton by Dr Robson



PIERRE FAUCHARD (1678-1761) REPORT ON A MEETING

David Hillam*[†]

From 31 March to 2 April 2011 the French society for the history of dentistry (La Société Française d'Histoire de l'Art Dentaire) held a special meeting to commemorate the 250th anniversary of the death of Pierre Fauchard (Fig 1)

The meeting was held in the historic setting in the council chamber of the former Faculty of Medicine in Rue de l'École de Médecine, close to the Sorbonne in Paris, under the Presidency of Danielle Gourevitch.

The conference was preceded by a cocktail reception at the headquarters of the l'Ordre National des Chirurgiens-dentistes near Place Victor Hugo, where delegates from France, Spain, Italy, Turkey and the UK were warmly welcomed.

The first morning of the conference concentrated on Fauchard himself. Pierre Baron opened with a fascinating and detailed analysis of the various portraits of the 'father of dentistry', in particular the painting by Le Bel that was engraved by Scotin and appeared on the frontispiece of *Le Chirurgien Dentiste*.¹ The theme of 'effigies' was continued by Henri Aronis. He discussed the depiction of Fauchard on the only French postage stamp to have an image associated with dentistry. That was issued in 1961 on the occasion of the bicentenary of Fauchard's death. Other stamps bearing Fauchard's image were on taxation stamps from Lebanon.

Of particular interest were papers by Micheline Ruel-Kellermann and by Julien Philippe. Documents discovered in the 1990s by descendants of Fauchard are now being analysed and restored. These include an annotated manuscript copy of his book with amendments made by Fauchard himself. Julien Philippe showed how the author's ideas evolved over time by comparing the three editions of his work. Xavier Deltombe presented and discussed the significance of series of letters written by Fauchard to his son in the 1750s. Other papers in this session gave a fascinating insight into the property that Fauchard rented for his rooms in Rue de l'Ancienne Comédie, just round the corner from where the meeting was being held. The landlord

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¹ Pierre Fauchard, *Le Chirurgien Dentiste, ou Traité des Dents, ou l'on enseigne les moyens de les entretenir propres et saines, de les embellir, d'en réparer la perte & de remédier à leurs maladies, à celles des Gencives et aux Accidents qui peuvent survenir aux autres parties voisines des Dents. Avec des Observations et des Reflexions sur plusieurs cas singuliers*, 2 vols Paris: Pierre-Jean Mariette, Three editions, 1728, 1746, 1786.

had a somewhat dubious reputation, to say the least, and an interesting insight was given into other occupants of the property and the social life of that part of Paris in the early 18th century. Fauchard's rooms were situated above the original Comédie-Française and opposite the first coffee house in Paris, founded in 1686. This still smart restaurant is where delegates enjoyed a superb meal later that evening.

Figure 1 Pierre Fauchard from Frontispiece to the 2nd Edition of *Le Chirurgien Dentiste*, 1746.



French hosts.

William Rogers was a dentist in Paris in the mid-19th century who wrote several important French textbooks. A paper given by a descendant (Michel Mailland) described how Rogers was born in Holland in 1818 as Wolf Benjamin Cohen. He came to England where he changed his name to Rogers. Ongoing research suggests that he married an English woman, Ellene Beville, daughter of a London surgeon, in the British Embassy in Paris.

The remainder of the conference was devoted to papers on a wide range of historical dental topics. They included the results of an excavation of a Bronze Age burial site in France with possible evidence of extractions for preventive reasons; an unusual form of tooth-wear (possibly occupational) in an Egyptian mummy from the 6th century BC; recent CT findings from the skeleton of Henry IV; the evolution of the hominid dentition, and the history of articulators.

This was an extremely informative conference, made especially enjoyable by the friendly welcome offered by our

MUSEUM STAND AT BDA CONFERENCE, MANCHESTER MAY 2011

Stanley Gelbier

The BDA Museum presented an excellent stand at the Conference, in cooperation with the Lindsay Society. The photos show aspects of the exhibition.

Figure 1 Sophie Riches and Melanie Parker man the stand



Figure 3 Helen Nield represents the Library

Figure 4 Melanie Parker explains the John McLean archive



Figure 5 Peter Frost discusses the exhibit with Marilyn Gelbier

Figure 6 A dentist examines a bone-handled brush

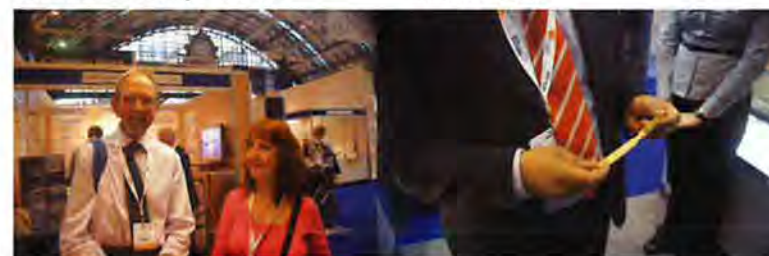


Figure 7 The Lindsay Society poster



One exhibit illustrates a project developed between Mrs Rachel Bairsto of the Museum and Professors Nairn Wilson and Stanley Gelbier of the Unit for the History of Dentistry, King's College London using a legacy from Dr John McLean, a leading dental practitioner and researcher. He was President of the British Dental Association in 1984. The project is studying the history of the dental profession by means of witness seminars and individual oral histories. The first seminar, held on 25 March 2011, brought together leading members of the profession to examine the historical development of the 'regulation of the dental profession'. Others will follow. There was much interest at the exhibit in these histories. The Museum team manning the stand recorded the interest of many dentists and others who would like to be interviewed about their professional lives. Readers who would like to be included should contact Sophie Riches (s.riches@bda.org).

Figure 8 The development team (from left to right Professor Nairn Wilson, Head of the KCL Dental Institute, Mrs Rachel Bairsto, Head of BDA Museum Services and Professor Stanley Gelbier, Head of King's Unit for the History of Dentistry)



PROF DR OSCAR SIXTO BONAL*

Diana Clara Daich de Eidelsztein[†] [‡]

Introduction

Dr Oscar Sixto Bonal (Fig 1) was born ninety years ago, on 25 October 1920, in the neighbourhood of Flores on Bogota Street, Buenos Aires (BA). To celebrate this important anniversary he agreed to be interviewed by the author.

Bonal was the youngest of three brothers. His own parents were Argentinian although their parents were European. Bonal's paternal grandfather was French, his wife Spanish. His maternal grandparents were both Italian, from the Friol area, near Udine. His father's father died in BA at a young age.

Figure 1 Prof Dr Oscar Sixto Bonal



None of Bonal's parents, grandparents or brothers were health professionals. He decided to imitate his childhood dentist, Dr Rodolfo Martínez: excellent, clean and nice; and didn't cause any pain. "I don't know if he really promoted healing but it did not hurt." He was under treatment for many years, from when he was a tiny child until the age of obligatory military service. At that time it was at 20 years of age; many years later it became 18 and it now no longer exists.

Bonal's interests were always towards biological subjects. At that time there were no specialized

secondary schools, but he was good at physics, chemistry, anatomy and botany. He also liked history, geography, literature but they were not to be his vocation.

* Based on an interview held at the office of the National Academy of Dentistry at the BA School of Dentistry, 8 October 2010.

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‡ Professor, History of Dentistry and Scientific Thinking, Maimonides University; honorary chief teaching assistant, Buenos Aires Faculty of Dentistry.

Bonal considered three possible vocations: medicine, histology and dentistry but it was dentistry which drew him from a young age, whilst still in high school. After leaving school in 1939 he followed an introductory course at university, studying chemistry, biology and physics.

He entered the School of Dentistry in 1940. This school was created as part of the School of Medicine in 1891.¹ In 1946 Professor Dr Guardo fought to gain the School the more prestigious faculty status. Guardo was simultaneously a congressman. He managed eventually to get acceptance for the School to become a Faculty.

Apart from his predisposition for dentistry Bonal was interested in the medical area. He took an examination to enter the School of Dentistry of the Faculty of Medical Sciences. He claims not to have been a brilliant student. However he obtained his dental diploma with no special difficulties, particularly studying hard those subjects where he was less good. Later Bonal presented a PhD thesis on 'The metabolism of enamel', which he had researched under Dr Rómulo Cabrini.

He then remained as a teaching assistant.² Although Bonal didn't have much interest in university teaching at the time, Ricardo Olivero, formerly a fellow-student, asked him to join him in histology, where he was an assistant. Bonal said he would enjoy it.

Certainly histology was a subject he much liked from his second year at the School. His friend introduced Bonal to the professor, Dr Romulo Cabrini, father of Romulo Luis Cabrini.³ Rómulo Cabrini was later *padrino* (godfather or supervisor) for his research leading to a thesis on the metabolism of enamel. So Bonal entered the Department of Histology, remaining there for several years as an honorary (ie unpaid) 2nd class assistant⁴ for about six years, "always serving as a patriot".⁵ But he liked it. At the same time he was also in part-time dental practice to earn money.

Bonal began to feel dissatisfied with many of the books he read on histology and embryology. He needed something better, especially on bone tissue. Bonal thus devoted much time to scientific study of this tissue.

He then entered Medical School where they gave dentists exemption from studying some subjects, although they did have to sit some examinations after entry to prove they knew enough about them. Bonal studied medicine for eight years but continued to work in his general dental practice and in histology, as well as part time in hospitals.

Although not so interested in being a physician he became increasingly interested in medicine. Upon graduation he began to work as a physician as well as a dentist. However the law did not allow him to practise both

professions in the same practice. Instead, he worked in another practice with a friend and colleague, Dr Carlos Alberto Massa (who taught pharmacology), and friend of the Chair while he was working in the Department of Pharmacology. They had a practice for general clinical medicine. He was fond of dermatology so followed courses on this subject, specializing in surgery and labour medicine (medicine devoted to people suffering from illnesses related to their job or illnesses or accidents that prevent them from working: in those cases a physician has to evaluate them). Afterwards he had a medical practice in important 'enterprises'.⁶ Several years afterwards Bonal became adjunct-second-professor in Pharmacology.

From that time Bonal's personal life became complicated. He wanted to get married. His future wife was a pupil of his and Massa: "a very pretty woman" named Eneida Cora Matilla. In spite of his efforts, at first she didn't pay attention to him but it all changed after she graduated. They married on 17 April 1959. However this and other events distanced him from the faculty, from which he quit in 1960. These were times of serious problems in Argentina's black history.⁷ So he mainly worked as a dentist and occasionally as a dermatologist.

It was at that time that a group of dentists from Buenos Aires joined together to found the School of Dentistry of the Faculty of Medical Sciences in La Plata (capital of Buenos Aires province, the main department in Argentina).

Dr Siutti⁸ was among the first to leave BA to go to La Plata to teach Operatory Technics. Bonal went there almost at the same time to teach Histology. He was appointed as an adjunct (ie sub-) professor by a *concurso* (selection committee). Bonal stayed there some six years.

Next came a vacancy for the Chair in physiology with general chemistry at La Plata. Having quit Buenos Aires in 1960, Bonal applied for this chair. By then he had already many years of experience as a physician and a dentist, and had much knowledge of many relevant subjects, eg anatomy for surgery, or physiology and anatomy.

Bonal was selected as the main professor in physiology and biological chemistry in the Faculty (no longer just a School) of Dentistry of La Plata. He remained there for many years until, in 1983, he quit La Plata to work only in histology in BA. For about 15 years he was the main professor in histology in La Plata.

He left BA in 1960 but came back in 1983 when democracy returned to Argentina. Since things changed in this Faculty of BA he was called to collaborate with the new authorities. He accepted again the Chair in BA, so made his re-entrée to histology and embryology.

Bonal stayed away from only BA because of the political conditions. This did not apply to La Plata because, as a public university, there was less political pressure there.

¹ Diana Clara Daich de Eidelsztein, Nicasio Etchepareborda (1857-1935), *Dental Historian* 2008; 48: 55-63.

² Diana Clara Daich de Eidelsztein, Prof Orestes Walter Siutti, *Dental Historian* 2009; 50: 102-108.

³ Presently a great friend of Dr Bonal.

⁴ Beginners are '2nd class' assistants. They may later become 1st class, usually paid, assistants.

⁵ As the UBA is a public university, one can consider it as serving the nation while not receiving a salary from the institution.

⁶ Enterprises are organisations which some of them own practices in BA province.

⁷ A previous article mentioned the situation related to Peronists and anti-Peronists. See Daich de Eidelsztein, op cit., fn.4.

⁸ Ibid.

So he then occupied two chairs. Life was crazy, Bonal travelled to both places by bus from Once (a neighborhood some 15 blocks from the BA Faculty of Dentistry). He went to La Plata every day but Wednesdays; even on Saturdays.

In addition, he again once or twice a week worked in his dental practice. And so he had to set aside medicine as it was impossible to continue with that too. But Bonal was a physician when advising Faculty colleagues. In those conditions he could do no more. So he quit La Plata and dedicated to his subject, histology, at BA.

Then he applied for selection to a Chair in BA. Meanwhile he was the *interino* (in charge as the Chair was vacant). He was appointed as the main professor 1960, remaining until his retirement in 1986.

Owing to his prestigious CV Bonal had other responsibilities as adviser and consultant to some private universities.

He became a researcher on primate bone tissue. This led him to become a well-known professor on osteo-integration for Implantology. That is his life *grosso modo*.

His teaching career

Bonal made teaching his career, after five years graduating as a 'free teacher' in histology. It was traditional to call someone a 'free teacher' if he graduated from teaching in addition to his basic discipline. In the Dental Faculty there is a special course for teachers to follow a sort of training programme in order to become a teacher at the university; giving an advantage over the many teachers who had not done such a course. It lasted for five years after the senior professor of the department gave authorization. Not everybody could follow this programme. The professor had to be sure that a person was ready for such training, so some people were quite old before they started.

Academic life

Bonal is president of the Dental National Academy so it is interesting to see how this academy came into being. In philosophical terms academies have existed through the centuries, as a result of the old Greek academies-academos, etc where people gathered. These people were the minority who knew a lot at that time. And so it has been throughout history.

Nowadays academies bring together knowledgeable people in specified subjects for teaching, research, maintenance of centres for diffusion of scientific knowledge of arts and letters.

Important people in the 1980's were the great masters such as Antonio J Guardo, Manuel B Galea, Adalberto Rebossio, Gabino García and Luis Barbero. They gathered and asked people to join them to create a big group, some of whom were younger than them.

Three professors formed a jury whose first task was to choose the first academic members of the Argentine Academy of Dentistry. They were Guardo from orthodontics; Galea from maxillo-facial surgery - a physician and dentist; and Adalberto Rebossio from clinical prosthesis. They sought support from some deputies (Parliamentary or Congress members) to create the Faculty. As

a public institution it was necessary for Congress to agree its creation. It was not easy to get it to agree a change of name from Argentine to National Academy of Dentistry but it was eventually achieved in 1999. This Academy had, and still has, no right to receive the financial subsidy which other academies receive from the State once they are National ones. The State accepted the nationalization of the Academy but without a budget. There is a current move to rectify this situation.

Bonal was a founder academic from 1984 up to now. He was vice-president and now president (December 2009-December 2011).

His contacts with dental organisations were based on memories from his boy scout days, always to do his best! And in life in general to do at least one good deed every day.

His family

Bonal had two brothers. The eldest was Raúl Juan, the second Héctor Jorge. Raúl passed away in 1987, Héctor in 2000.

His children are Eduardo Oscar and then Raúl Guillermo. The eldest is Licenced in Enterprises Administration, with a high post in the Board of Telefonica. The second one is Director (head teacher) of a private high school. Both are in the city.

There are also grandchildren. Eduardo has two girls and then a boy. Raúl has a boy and a girl. The eldest grandchild, Eduardo's daughter, is studying Law in the Catholic University. None are following in Bonal's footsteps.

Other dental activities

Bonal also worked a lot in La Mutual Odontológica Argentina⁹ because he has been since 1949 a member of its Directive Commission, now as substitute of a controlling section. He regards 'La Mutual' as his second home, *feeling much at ease in this institution as if it were his home*.

Even now Bonal attends scientific sessions of La Dental Argentina (he was sitting in the audience when I presented my lecture on history). He has been a member of both the Asociación Odontológica Argentina and La Dental Argentina for many years.

He is also a life member of the Mutual Odontológica, Asociación Odontológica Argentina, Círculo Argentino de Odontología, and Asociación Argentina de Ortopedia Funcional de los Maxilares.

Among Bonal's many activities are a 1983 translation into Spanish of the updated and improved book on Oral Histology and Embriology by Orban-Bhaskar and publication of 30 scientific papers. He lectured and presented many courses on his specialty and supervised five theses.

Bonal received many prizes including a 1952 gold medal for histology. He taught not only in universities but also in high schools (biology).

Finally Professor Bonal said: If I forgot anything, write it down.

⁹ A dental organization that also provides insurance for dentists.



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