Volume 64 (1)
January 2019

Dental Historian

1972 1878 2014

1962 1099 1957

1530 1540 1543

1655 1685 1857

1768 1771 1778

1783 1808 239

1840 1844 1872

1851 1870 1895

1893 1894 1946

D E N T A L H I S T O R I A N

NUMBER 64 (1)

January 2019

Contents

Dental Historian

The Dental Historian (DH) is an international journal that publishes peer reviewed papers, biographies and descriptions of historical artefacts. The DH accepts manuscripts online. It is a condition of acceptance of a manuscript that it has not previously been published or is not under consideration of publication in any other journal. If more information is required then please contact the Editor. Persons wishing to submit a paper for publication should send it to **Dr Margaret Wilson, Editor** at **m.wilson1000@btinternet.com**

Manuscripts should be sent as Word documents, single spaced, Times New Roman, font size 12 and left justified. Images should be sent as separate jpegs.

The publisher and editor cannot be held responsible for errors or any consequences arising from information in this journal. The views and opinions do not necessarily reflect those of the publisher and editor.

Authors are reminded that it is their responsibility to obtain permission for publication of images in the Dental Historian.

The *Dental Historian* is sent free to members of the Lindsay Society.

Lindsay Society Officers 2018/19

President	Roland Hopwood	roanhopwood@btinternet.com
Immediate past-president	David McGowan	dmmcgowan@btinternet.com
Hon Secretary	Brian Williams	brianwilliams14@btinternet.com
Treasurer	Noel Stamp	noel.stamp@yahoo.co.uk
Committee members	Rachel Bairsto	
	Stuart Geddes	
	Craig Rushforth	
	Andrew Sadler	
Editor of Dental Historian	Margaret Wilson	m.wilson1000@btinternet.com
Associate Editor	Nairn HF Wilson	

Membership

Membership applications should be sent to the Honorary Secretary, Dr Brian Williams, 14 Howard Road, Great Bookham, Surrey, KT23 4PW.

Email: brianwilliams14@btinternet.com

Subscriptions

£30.00 Individual UK membership
£49.00 UK Joint membership-both at same address
£38.00 Individual overseas member, payable in sterling.
£58.00 Overseas joint members-both at same address, payable in sterling
Free to UK student members of the BDA
£30.00 Overseas dental student
Single issues can be bought by sending a cheque for £16.00+P&P made out to the "Lindsay Society for the History of Dentistry".

For on-line banking Account No. 10868167 Sort Code 20-51-43.

For international payments SWIFTBIC BUKBGB22, IBAN GB69BUKB 4310 8681 67

All requests should be sent to the Distribution Manager, Dr Stuart Geddes, Ysgubor Argoed, Tregagle/Monmouth, NP25 4RY. E Mail stuart_geddes@hotmail.com

Editorial

November 2018 saw the 100th anniversary of the Armistice of the Great War. The war was truly devastating with huge numbers of troops being killed or severely wounded. But even out of this miasma of horror, some good did emerge. This war resulted in the formation of dental services for the armed forces. The troops in addition to their many different oral and dental problems suffered terrible injuries, particularly to the head and neck, and as a result, there evolved many great surgical innovations and developments in the treatment of head and neck trauma.

In the Northwest, Manchester Dental Hospital was just one of the UK hospitals that made a contribution. Volunteer dentists too old to sign up and students who had yet to graduate played a significant role in trying to make the servicemen dentally fit during the war. After the war ex- servicemen were encouraged to train as dental mechanics.

Dentists W A Hooton and SS Doran resigned from their posts on the Manchester Dental Hospital staff and with B J Rodway from the Salford Royal Hospital joined the 2nd Western General Hospital and formed a Jaw Injuries Unit, first in Ducie Avenue, Manchester and later in Mosely Road, Fallowfield, Manchester. They treated many wounded servicemen and advanced the clinical treatment of jaw injuries including early work on bone grafts and plastic surgery. Rodway's map of incision lines on the face became an important contribution to the prevention of scarring.

Soldiers being treated in dental School

Tower of London November 2018

In 1918 Dr Pinson, a well-known Manchester anaesthetist was appointed as an honorary anaesthetist to the Manchester Dental Hospital. One of Dr Pinson's inventions was the "Pinson Bomb", which was a device that allowed ether to be administered in a controlled manner. The "bomb" consisted of a hollow metal sphere able to withstand high pressures. Ether was placed in the sphere and the sphere was surrounded by hot water. The ether was converted to a gas under high pressure which could be released in a controlled manner. Patients were able to have oral surgical procedures with all the advantages of the administration of ether.

In 1919 the Dental Hospital Manchester, impressed by the value of dental radiography in diagnosing jaw injuries during the war, purchased the first x ray machine at a cost of £175. This gave significant benefits to the civilian population after the war.

At the Lindsay Society meeting in Glasgow, Carol Parry and Elaine Morrison gave an account of the Scottish Women's Hospitals during the First World War. We heard about Kate Latarche, the first female dentist to graduate LDS and BDS from the Victoria University Manchester. She was the only UK female dentist to provide treatment overseas in WW1, a truly remarkable and brave young woman.

Of course, when remembering the contribution of dentistry in WW1, dentists, dental hospitals, students and technicians from all over the UK played a vital role either treating civilian patients, soldiers or by enrolling in the armed services. It is the duty of our and future generations to continue to remember their sacrifice.

The Lindsay Society's Annual Conference in Glasgow

Friday 5th – Sunday 7th October 2018

This year the Society's Annual Conference went north of the border to The Royal College of Physicians & Surgeons of Glasgow where our President David McGowan is a Fellow.

Most of the 61 delegates arrived Friday afternoon at the very comfortable Indigo Hotel in the very heart of the city and only a couple of blocks away from our Royal College venue. A pre-ordered supper at the hotel, provided by Marco Pierre White's restaurant on the ground floor, proved the perfect place to greet colleagues and strike up new friendships.

The business side of the Conference started the next morning at 9.00am with David McGowan welcoming everyone to the magnificent surroundings of the Royal College, steeped in over 400 years of history and with a state-of-the-art lecture theatre ready for our use. Presentation followed presentation with Austin Banner and Sophie Riches, from the British Orthodontic Society, giving the first lecture entitled "The Ballards & Orthodontics in the NHS". This was followed by John Craig speaking about "Hugh Peebles dental mechanic, teacher & artist". After the obligatory coffee-break, Roland Hopwood gave a very amusing talk on pseudo-science "Phrenology & Dentures A Way A Head". The last Lindsay lecture of the morning was presented by a young colleague Anisha Gupta, "Brush, Spit, Rinse – An exploration of the global history & development of oral hygiene products". This had been her final year elective research project at dental school.

At midday Margaret Wilson was the speaker for the prestigious Menzies Campbell Lecture "History of the Smile, myths perceptions and reality". A very interesting and thought-provoking explanation of the changing attitudes to the smiling face.

Saturday afternoon found the delegates on a coach heading to the Royal College of Surgeons of Edinburgh where they were shown items and pictures from the Menzies Campbell collection and skulls used by Paul Tessier in developing cranio-facial surgery. Then back to Glasgow for a superb Conference Dinner in the magnificent College Hall. And then to bed!

Sunday was another 9.00am start with a joint presentation by Rachel Bairsto & Fiona Gray, from the BDA Museum in London, entitled "WW1 dental Services". Needless to say, it was a real eye-opener to hear there was no dental treatment initially available for the hundreds of thousands of troops sent to the front at the start of the war. It was only because General Haig, Commander-in-Chief of British forces, got severe toothache that the situation changed.

Then Carol Parry and Elaine Morrison, both associated with the RCPSG, spoke of the pioneering work undertaken by "Kate Latarche, Dentist with the Girton & Newnham Unit of the Scottish Women's Hospitals during the First World War". A little-known story which succeeded against all the odds; almost wiped from history.

George Camilleri, from Malta, gave the last lecture of the conference. " Glasgow & the Dental Hospital 60 years ago. A personal Recollection". How things have changed in Glasgow and in specialist training over the last half century; with many names remembered.

After coffee, there were tours of the RCPSG library and heritage collections, led by Andrew McAinsh and Clare Harrison, each expert in their chosen field. A great way to finish the 2018 Conference.

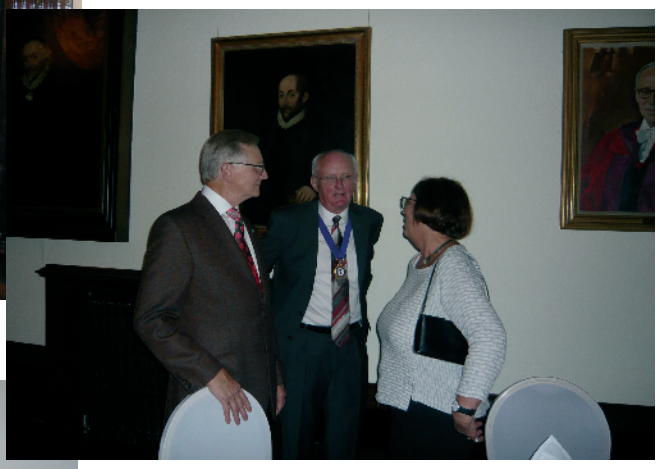
It had been a diverse programme, an educational programme, a fun programme and a social programme in a stunning environment. In other words, a typical Lindsay Society conference!

Next year the Conference moves to Leicester between 4th - 6th October – see you there!

Brian Williams.

Delegates enjoying the Conference

Delegates and speakers at the RCPS Glas



Dental Historian 2019 64 (1) 1-5

A Evolution of the Dentists in Francophone Comic Strips. Part 2. Cartoons in Clinical Situations

Remi Esclassan, Pierre Baron, Mariane Fautrier, Gerald Bernardin, Jean-Noel Vergnes

Anaesthesia

In "Korrigan", the representation is fanciful and non-academic but "hardly" efficient[1]. A charlatan is putting his victims to sleep by means of a knock on the head delivered by an accomplice. A much more realistic representation is shown by Lampil (1976), in the "Poor, poor Lampil" story[2]. In this story, the handling of the syringe is quite brutal but efficient (Figure 11).

This vision of an authoritarian dentist was common in the seventies and contributed to the bad image of the dentist in the collective unconscious mind. The medical use of nitrous oxide or "laughing gas" offered the profession a new way to sedate the patient. But it also gave ideas to comic artists, who had a tendency to "divert" it from its original indication. In "The veil affair" (« L'affaire du voile », Petillon, 2006), the dentist uses laughing gas for her personal needs, to relieve stress[3] (Figure 12).

Extractions

A tooth extraction is the clinical situation most frequently represented in comics with odontologists. It is interesting to note the details of the ergonomy and the position of the surgeon. In "Korrigan", it is represented as quite unconventional but very efficient (Figure 13). But the dentist can also be a victim. In "L'histoire en bandes dessinées" (Cicuendez, 1973), Cicuendez related short stories that happened in the Far West[4] (Fig 16). In a story called "Le shérif intrépide" ("The intrepid sheriff"), set in the 19th century, a criminal cowboy went to the dentist for an extraction. But the dentist was frightened and, under pressure, extracted the wrong tooth ("A good one! I've taken a good one out") (Figure 14). To take his revenge, the cowboy tortured the dentist by savagely extracting his teeth. Lampil and Cauvin (2014), offered a more realistic representation of what may have been an extraction during the War of Secession, in their comic series: "Les tuniques bleues" ("The blue tunics") [5]. It is interesting to note the position of the dentist faced with his patient and how indispensable the help of the two heroes,

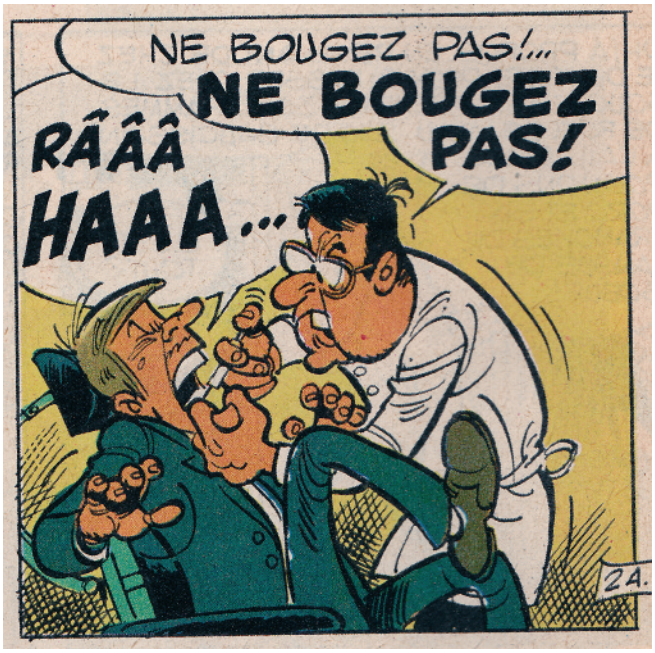


Figure 11. extract from Lampil et Cauvin. « Pauvre, pauvre Lampil ». Le journal de Spirou, n°1999. 1976 :41-44. Bubble Translation: 'Don't move. Don't move'

Figure 12. extract from Pétillon. « L'affaire du voile ». Paris, ed. Albin Michel, 2006. p. 17.

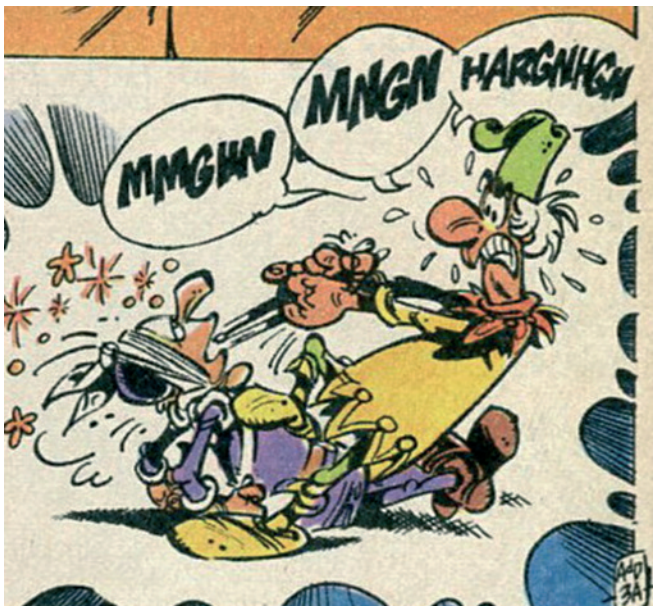


Figure 13. extract from Franz et Vicq : « Les aventures de Korrigan : l'arracheur de dents ». Le Journal de Tintin. n°5149, 1975, 6p.

Chesterfield and Blutch, would have been to hold the patient down during this complicated and painful extraction (Figure 15).

Other specialties have also been represented, such as prosthodontics, including veneer and a complete removable denture. Although "D.D Zilch" showed a magnificent diamond veneer in Lucky Luke's "Western Circus"[6] (Figure 16), it is more often the complete removable denture that is the present in comics. It involves comic scenes between grandparents and little children. For instance, Titeuf imagined that his grandmother's denture was piranha's teeth. He tried to feed it a chewing-gum![7] (Figure 17)

With orthodontics and pediatric dentistry, children are often associated in comic situations. The authors of comics enjoy making dentists meet children. In the eyes of children, the dentist is a "scary" person they do not visit willingly. Orthodontics is humorously and often cruelly depicted with children, for instance, in a Titeuf story, with a little boy named "Jean-Claude"[8]. This boy is treated for a significant class II malocclusion which is a real handicap for him. He has to wear a Delaire's mask and has difficulties in speaking correctly, making numerous droplets of saliva. And all his friends make fun of him every time he speaks and because of the way he looks (Figure 18). This situation reminds us that children can be cruel to each other. Another interesting orthodontic point concerns bad habits such as video games making an intermaxillary space. Kid Paddle

Figures 14. extract from Cicuendez et Joly : « l'histoire de France en bandes dessinées », ed. Dupuis, 1973. Bubble translation: but the practitioner is tembling… 'A good one!…I extracted a good one…'

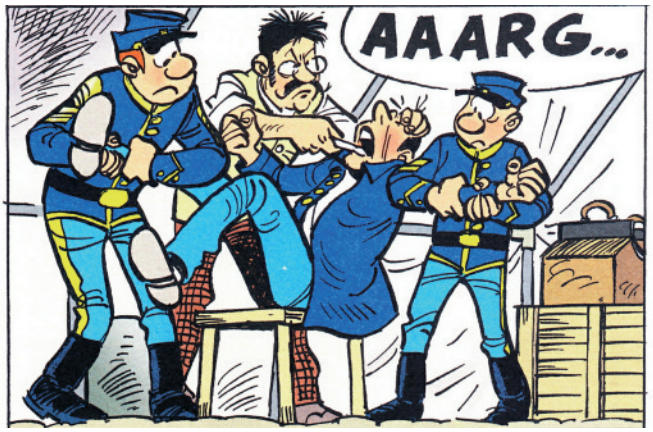


Figure 15. extract from : Les tuniques bleues : « Les bleus se mettent au vert ». Tome 58. Belgique, ed. Dupuis 2014. P.44.

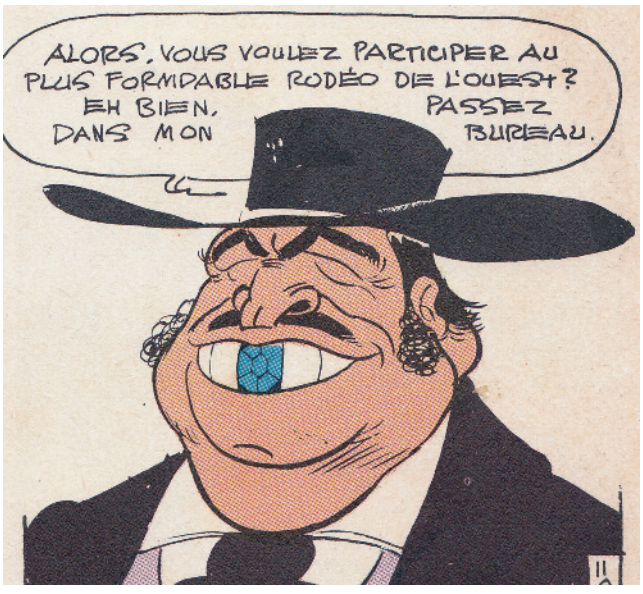


Figure 16. extract from Morris et Goscinny. "Lucky Luke: western Circus". Belgique, ed. Dargaud 1971, 46 p. Bubble translation: 'So you want to take part in the greatest rodeo in the west? Well, come to my office.'

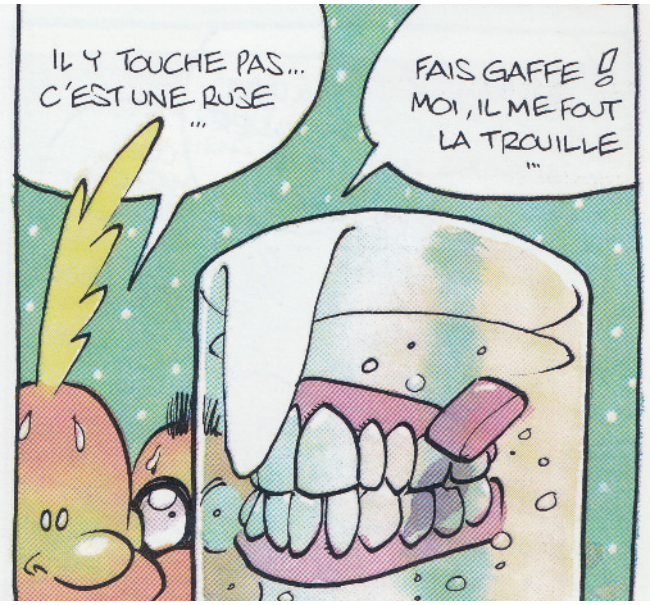
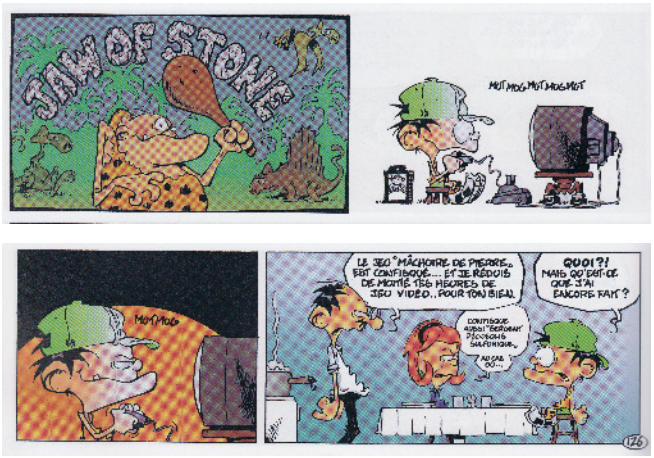


Figure 17. extract from Zep. « Titeuf : L'amour, c'est pô propre… » Tome 2. Paris, ed. Glénat, 2000. p.44. Bubbles translation: 'He's not touching it. It's a trick'. 'Watch it! He really scares me'.

Figure 18. extract from Zep. « Titeuf : Lâchez-moi le slip ! » Tome 8. Paris, ed. Glénat, 2010. p.46. Bubbles translation: 'He comes back from the dentist' 'Poor guys!'

("Waterminator", 1997) is playing a video game entitled "Jaws of stone", whose hero is a figure with serious prognathia[9]. At the beginning of the game, Kid Paddle is in a normal skeletal class 2 (frequently found in children of this age) and, the more he plays, the more he identifies with his hero, becoming prognathic himself, to his parents' despair! (Figures 19-20).



Figures 19-20. extracts from Midam. "Kid Paddle : Waterminator". Tome 7. Belgique, ed. Dupuis, 1996, p.37. Bubbles translations: 'Your game 'stone jaws' is confiscated. And I'm cutting video game time in half. For your sake'. 'Also confiscates sulfuric vomiting sergeant, just in case…'What?! But what did I do again?''

Gender

At the beginning of the seventies and through to the nineties, the dentist was mostly drawn as a male, experienced, around fifty years old and concerned essentially by surgery and extraction. In more recent representations, men are younger and kinder, paying attention to their patients[10] and we can notice more and more women, with skills and qualities that please both children and older patients[11] (Figures 21-23)

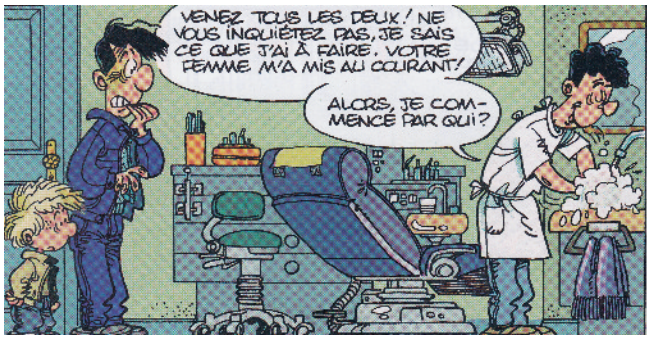


Figure 21. extract from Laudec. « Cédric : Pépé se mouille » 1994, Ed. Dupuis. Bubbles translation: 'Come here both of you! Don't worry, I know what I have to do. Your wife informed me! So, who do I start with?'

Is there a "heroic" dentist?

Even if there is not a specific collection or album dedicated to a "dentist hero", the dentist may sometimes be described in a heroic situation such as in "Double vol" (1973), (French for "double flight" or "double theft"), Natacha, the heroine and stewardess, is manipulated by a terrorist group[12]. She has been kidnapped and released by terrorists who have implanted a small explosive charge in her molar to force her to cooperate. She needs the help of a dentist to retrieve this charge and save her from

Figures 22-23. extracts from Tome et Janry. « Le petit Spirou. C'est pas de ton âge ». Tome 9 Bubbles translation: "Doctor Drill has just retired and I am her substitute" "It is the boy who has an appointment I think?" "I will bring him back in a few minutes…" "Let's see, yes! Here…"

manipulation and death. At first, the dentist is not ready to cooperate as she gets to his dental office late at night. But she is persuasive enough and he does the job meticulously. She is grateful to him ("je lui dois une fière chandelle" i.e. "I owe him a debt of gratitude"). (Figures 24)

Conclusion

In conclusion, comics offer a funny representation of odontology and dentists, by creating comic situations in a dental environment. Although the "comic side" is essential, there is great realism in these different situations. On the model of artists from the last centuries, authors of comic strips caricature but appreciate the representation of odontology. Comics faithfully reflect the evolution of odontology, concerning mainly the material and the techniques but also the professional sociology. Today, the message of prevention is also more present. Comics form a medium that can concern both parents and children and even if they will continue to play on fear of the dentist and comic situations, they do not deprecate prevention and hygiene. As in Bercovici and Cauvin's comic "Les dentistes", the dentist's competence is fully

Figure 24. extract from Walthéry et Mitteï. « Natacha : Double vol ». Editions Dupuis 1973 : 100-106. Bubbles translations : "Thanks a million times Doctor, and don't forget to give me the filling" "Yes! Aaah, women!" "I owe him a debt of gratitude".

recognized and so is the necessity to have good teeth and good hygiene.

References

1. Franz and Vicq 1975: « Les aventures de Korrigan : l'arracheur de dents ». *Le Journal de Tintin* n°5149, 6p.

2. Lampil and Cauvin. 1976 « Pauvre, pauvre Lampil ». *Le journal de Spirou*, n°1999 : 41-44.

3. Pétillon. 2006. « *L'affaire du voile* ». Paris, ed. Albin Michel, p. 17.

4. Cicuendez and Joly. 1973. *« l'histoire de France en bandes dessinées* », ed. Dupuis.

5. Lampil and Cauvin. 2014. *"Les tuniques bleues : les bleus se mettent au vert »*. Tome 58. Belgique, ed. Dupuis. p.44.

6. Morris and Goscinny. 1971. "*Lucky Luke: western Circus*". Belgique, ed. Dargaud, 46 p. Figures 21

7. Zep. 2000. « *Titeuf : L'amour, c'est pô propre…* » Tome 2. Paris, ed. Glénat, p.44.

8. Zep. 2010. « *Titeuf : Lâchez-moi le slip !* » Tome 8. Paris, ed. Glénat, p.46.

9. Midam. 1996. "*Kid Paddle : Waterminator*". Tome 7. Belgique, ed. Dupuis, p.37.

10. Laudec. 1994. « *Cédric : Pépé se mouille* », Ed. Dupuis.

11. Tome and Janry. 2000. « *Le petit Spirou. C'est pas de ton âge* ». Tome 9

12. Walthéry and Mitteï. 1973 « *Natacha: Double vol* ». Editions Dupuis : 100-106.

Address for correspondence:

Rémi Esclassan, Toulouse Faculty of Odontology. Laboratory AMIS UMR 5288 CNRS. 03, Chemin des Maraîchers, 31062 Toulouse cedex 09, France. / remi.esclassan@univ-tlse3.fr

Authors Biography:

Remi Esclassan, DDS, PhD, is senior lecturer in prosthodontics at the Dental Faculty of Toulouse. He belongs to the French Society of Dental Art History (SFHAD) and is interested for many years by the links between odontology, history and comics.

Pierre Baron, DDS, PhD, historian at the Dental Faculty of Paris V. He is the President of the SFHAD.

Mariane Fautrier, DDS has a private practice in the south of France. She wrote a thesis about comics and dentistry.

Gerald Bernardin is a medical Doctor (MD). He has created the most popular French website specialized in comics and health (http://www.bdmedicales.com).

Jean-Noel Vergnes, DDS, PhD, is senior lecturer in Epidemiology at the Dental Faculty of Toulouse. He is very much involved in Graphics in Medicine.

Editor's Note

Part 1 of this paper can be found in the Dental Historian Vol 63(2) July 2018, 62-68.

Dental Historian 2019 64 (1) 6 - 11

Special Dental and Comparative Anatomy in the University of London (with some notes on national teachers)

Stanley Gelbier, Barry Berkovitz and Moya Meredith Smith

Abstract: This paper examines the evolution and then reduction of special dental and comparative anatomy courses for the BDS examinations of London University, especially in relation to Guy's, King's and the Royal Dental (all merged as King's College London Dental Institute in 1998). There is also a summary of national teachers of the subject. Whereas sixty years ago these subjects were important, nowadays undergraduates learn little or nothing about them.

Key words: Comparative and special anatomy, University of London BDS, UK teachers of dental and comparative anatomy.

The first dental degrees

In 1904 Birmingham and Dublin Universities published regulations for dental degrees. Two years later Birmingham awarded the first BDS to Harold Round and John Dencer Whittles, by which time Leeds had also agreed regulations. However it was felt by some people, "notably in London", that the status of the Royal College's LDS might suffer as a consequence.[1]

In 1901 dentistry was recognised by London University which established a Board of Studies in Dentistry and 'recognised' some teachers. The Board members were Rickman John Godlee, BA, MB, MS, FRCS, Charles Sissmore Tomes, FRS, MA, FRCS, LDS, Peter Sidney Spokes, MRCS, LDS, William Adolphus Maggs, MRCS, MRCP, LSA, LDS, John Henry Badcock, MRCS, LRCP, LDS, Morton Smale, MRCS, LSA, LDS, William Hern, MRCS, LDS and William Bromfield Paterson, FRCS, LDS.[2] Tomes was the chairman and Hern was honorary secretary.

The Board proposed that "any scheme for a Dental Curriculum must … embrace some portions of [the] medical and surgical studies prescribed for medical students". However it was premature to recommend one for dental students until the Faculty of Medicine decided on courses of education and examinations for its students;[3] and said it was undesirable to have a separate entrance examination for each faculty. All should study Latin, English and Mathematics; plus either Greek, French, German, Arabic, Sanskrit or a science. A single matriculation examination for all faculties in which Latin was not compulsory would be unacceptable to the Board, in which case a separate examination for each faculty would be preferable. It recommended that a suitable alternative for the matriculation should be accepted by the university.[4] So from the beginning they recognised a need for an intellectual basis rather than just learning about the profession's work.

Although London instituted the Board in 1901 it had no dental degrees for many years,[5] perhaps because many London teachers were involved with the nearby Royal College of Surgeons of England. By then there were three London dental hospitals and schools: the [to be Royal in October] Dental Hospital of London, the National Dental Hospital (which had joined the Metropolitan School of Dental Science and was later incorporated into University College Hospital) and Guy's Dental Hospital.

The London BDS

The situation changed in the 1920s. The First and Second Examinations in Dental Surgery for the London BDS were held in 1924; the Third (Parts 1 and 2) in 1926; and the Fourth in 1927. In July 1927 Cyril Hall and Cyril Godfrey Walmsley were the first candidates to gain the new BDS. Before then all London students took the LDS exam. A new era had commenced.

The regulations for the first courses state[6] that before sitting the 2nd BDS exam students should attend courses in anatomy, physiology, special anatomy, and histology and pharmacology (including pharmacy and materia medica) in year 2 and term 1 of year 3. That exam could be passed not less than 17 months after passing the first exam (in organic chemistry, physics and general biology).

The 1923 curriculum included special anatomy - not less than 20 lectures and demonstrations over two terms; and dental histology - not less than ten classes over three months. The syllabus (Table 1) shows a strong inclusion of comparative anatomy.

There was a two hour written and an oral exam for special anatomy and histology.

Perusal of exam papers show this pattern continued for a considerable period although their titles changed over time: e.g. July 1940, Special Anatomy, Special Physiology and Dental Histology. Three out of 4 questions had to be answered. Table 2 indicates the range of relevant questions. The anatomy of animals featured over the years.

Early papers name the examiners: one from London, a second from elsewhere. They were some leading proponents of the subject, including Henry Leslie Messenger, Thomas William Widdowson, Prof AEW (Loma) Miles, Alan Shefford, Prof HM (Pick) Pickard, James H Scott, Ron W Fearnhead and B Rudolph Sprinz.

The 1950s and 1960s

So what was the situation when two of the authors (BK and SG) became students in 1957? And how has the teaching of dental anatomy changed over the years? Amongst the subjects they studied were oral and comparative dental anatomy; anatomy of the head and neck, skulls and teeth of the animal kingdom. They were taught in specific lectures and seminars in year 1 for the 2nd BDS exam, in addition to general anatomy and physiology. The exam was brought forward from term 4.

When BK started teaching dental anatomy in 1966, many UK schools had a senior and junior member of staff teaching the subject, with lectureships in dental anatomy. Although Moya (MMS), as a basic scientist, was first recruited by King's in 1968 by Martin Hobdell, the majority of lecturers were dentally qualified and undertook research, often with a histological/structural bias. Many people listed in Table 3 contributed massively to dental research output, presenting numerous papers at annual meetings of the British Division of the IADR. For example, in 1969, under the presidency of CH Tonge, there were 115 relevant abstracts. By 1982, under the presidency of D Anderson, the number had risen to 246. With time, designated posts in dental anatomy at each institution were lost, eventually leaving none.

In earlier days a good foundation in dental anatomy, including some comparative dental anatomy, was considered essential for undergraduates. One member of staff was usually in charge of the course and gave all the lectures, supported by practical classes using microscopes. Table 3 lists many teachers of dental anatomy, including some clinicians with an interest in the subject.

Table 1 The 1924 syllabus

- Development of the face, jaws, buccal cavity
- Development, calcification and eruption of the teeth
- Anatomy, histology and functions of dental tissues, gums and alveolar process, maxillary sinus, nose and other parts concerned in dental surgery
- The temporo-mandibular articulation, movements of the mandible and occlusion of the teeth
- Typical examples of adaptive modification to function as shown in the form, structure, attachment and arrangement of the teeth in the lower animals
- The general characteristics of the dentitions of mammalia
- The teeth of primates
- The jaws and teeth of prehistoric man
- The evolution of the human teeth

Few, if any, schools now regard knowledge of dental anatomy in its widest form as an essential subject taught by a specialist; and comparative anatomy is never taught. Neither does it warrant a separate and detailed examination. At King's, 'experts' still teach part of dental anatomy, e.g. tooth anatomy, but certainly no comparative anatomy. This is not surprising as comparative anatomy and perhaps some other parts of special anatomy are no longer needed to satisfy the dental regulator, the General Dental Council. But as an academic discipline, should dentistry be totally controlled by this need? Similar questions are being asked throughout the university sector, especially where government money is involved.

In the 1950s and 1960s there was much comparative anatomy in the courses, as reflected in the standard UK textbook, Scott and Symons' Introduction to Dental Anatomy. Its nine editions between 1952 and 1982 contained significant coverage of comparative dental anatomy. BK is proud to be quoted in their reference list.

Table 2 Sample comparative anatomy exam questions (University of London, King's, Royal Dental Hospital)

Date	Uni/ College	Question
July 1940	Uni	1. Describe the naked eye appearances of the second maxillary and mandibular permanent molars from Man. What are the common variations? How do these two teeth differ from the corresponding ones in the Anthropoid Apes?
		2. How are the teeth of fishes and reptiles adapted for various functions?
July 1950	Uni	Compare the characteristics of the teeth and jaws of Man with those of the crocodile
Dec 1950	Uni	1. Describe the human temporo-mandibular joint and state how this joint is modified in different groups of mammals
		2. Discuss the various functions teeth may assume in the animal economy, giving examples
July 1960	Uni	Write brief notes on … Types of tooth succession
Dec 1960	Uni	Illustrate the relation of form to function by comparing the skull of an anthropoid ape with a human skull
July 1970	Uni	No comparative question
July 1967	K	With special reference to the features of the skull and jaws including the teeth, trace the evolution and development of the Hominidae subsequent to the establishment of the early Anthropoids.
Dec 1968	K	Mock 1. Give an account of the evolution of the mammalian jaw joint. Correlate this, as far as possible, with the other evolutionary processes involving the skull.
		2. Compare and contrast the jaw and dentition of a carnivore with that of a herbivore. How are the differences described related to function?
		3. Write short notes on four of the following: Diphyodont dentition; Meckel's cartilage; Dermal Bone; the human upper right first permanent molar; the codont dentitions.
July 1971	K	1. State what you understand by the term 'natural selection' when it is used in an evolutionary context. Illustrate your answer by reference to the evolution of man from his early ape-like ancestors.
		2. Describe in detail the structure (including the histology) of the temporo-mandibular joint in man and explain how its structure can be related to its function. Add a note on its evolution.
1972	K	1. State what you understand by the term 'natural selection' when it is used in an evolutionary context. Illustrate your answer by reference to the evolution of man from his early ape-like ancestors.
		2. Describe in detail the structure (including the histology) of the temporo-mandibular joint in man and explain how its structure can be related to its function. Add a note on its evolution.
1972	K	Mock 1. Outline the major features of the way in which the human skull has evolved from its earliest ancestors; how may this be demonstrated from an examination of fossilised skull material?
		2. What are the special features related to the skull which distinguish primates from other mammals?
July 1972	R	Give a brief account of each of the following:
		The morphology of the human deciduous dentition; the dentition in carnivorous animals.
July 1973	R	Write an account of each of the following: … variation of the mandibular joint in mammals.
June 1974	R	Write notes on: the rodent dentition; the origins and function of the intra-articular disc of the mammalian temporo-mandibular joint.
Dec 1974	R	Discuss the horizontal succession of teeth
	R	Mock Elephant molars
June 1975	R	Give concise account of the dentition and jaws of New World Monkeys
Dec 1975	R	Dentition of herbivores.
June 1976	R	Give an account of the form and function of 2º dentine in man and other mammals.
June 1983	R	Describe the various types of dental adaptations which have evolved in herbivorous animals in response to the problems of dealing with abrasive diets.
Sept 1983	R	Compare the adaptations in the teeth and jaws of mammals with an omnivorous diet to those with a carnivorous diet.

Uni = Univerity of London K = King's R = Royal Dental Hospital

For RDH students, comparative dental anatomy was well supported by many animal skulls in its museum. Some went back to the origins of the Dental Hospital of London, gifted by members of the Odontological Society of London.[7] BK remembers the high standard set by the Royal's Harry Blackwood. Before the days of handouts he went in early, spending at least an hour chalking up full and wonderful notes on the blackboard to accompany his lectures and practical sessions. He also recalls lectures there from Beverly Halstead, whose book on mineralized tissues contained much comparative content. At that time some students (including SG) from the then five London undergraduate schools thought the subject was so important that they sought additional teaching. They attended Reggie Course's premises in Hampstead, where he provided excellent private evening tuition in a room over his practice.

Current developments

Although comparative anatomy is no longer taught in the dental course there is an upsurge of interest in the topic. Recently the teeth of various vertebrates have been used as experimental systems to understand the molecular biology of evolution.[8] In this context, we can consider some of MMS's world-renowned research programme on dental and skeletal development and evolution. She has published many papers on how regulation for this pattern is inherited and modified through development and worked extensively on enamel structure in fish teeth and how it may have evolved from enameloid.[9] BK has also published many papers on comparative dental anatomy that have shed light on the human condition, culminating in the publication of two books devoted to the dentitions of all vertebrates.[10, 11]

Changes in the schools

By the 1960s there were five London undergraduate schools: RDH, KCSM&D, Guy's, UCH and the London. By 1998 UCH and the Royal had closed, with remnants of the latter being incorporated into UMDS (the United Medical & Dental Schools of Guy's and St Thomas's), which merged in that year with KCSM&D into King's College London. There are now only two schools in the Capital, the London having become part of Queen Mary University London in 1995. Each has developed its own regulations and exams for the BDS degree. Although still a member of London University, KCL now has degree-awarding powers so no longer has to comply with university rules on curricula.

The influence of Europe and the GDC

In 1957, when six countries signed the Treaty of Rome to form the European Economic Community (EEC, precursor of the EU), a major aim was to promote the free movement of people, goods and services between the member states,[12] so rules for harmonization were needed. Its 1976 Directive 76/686/EEC on the mutual recognition of dental qualifications implies students have similar courses of study across the Union. It guarantees dentists acquire an adequate knowledge of specified topics including:

- *The sciences on which dentistry is based;*
- *The structure and function of healthy and diseased teeth, mouth, jaws and associated tissues, and their relationship to general state of health and to patients' physical and social well-being.*
- *Their five-year education must include anatomy, embryology, histology including cytology, physiology, biochemistry (or physiological chemistry) and pathological anatomy.*

This is reiterated in the 1998 specialist regulations[13] which brought European regulations into English law. Although it doesn't include dental anatomy per se, obviously that has to be studied to make possible subsequent clinical studies. However, there is no mention of comparative anatomy.

The GDC's influence on course content is now also less detailed, focusing on outcomes rather than detailed learning content. The Outcomes in the Clinical Domain document states that as a foundation for practice:

"The registrant will be able to apply the practice of dentistry principles that derive from the biomedical sciences"; "identify relevant and appropriate dental, oral, cranio-facial and general anatomy and explain their application to patient management"; and "describe relevant physiology and discuss its application to patient management."

The situation in 2018

In the context of these learning outcomes, King's has carte blanche to teach what it decides is appropriate. Its BDS programmer has three main teaching components vertically integrated throughout the five years.[14] The first consists of subjects common to medicine and dentistry: biomedical sciences, behavioural sciences, epidemiology, pathology and microbiology, and human disease. At first glance, it is difficult to see where dental anatomy per se fits in. At King's, a decision was made long ago to have combined examinations rather than individual subject-based ones.[15] Although there is no separate exam in anatomy and dental anatomy, there are questions in exams for both years 1 and 2 as part of an MCQ and short answers on these topics. Although dental morphology is still an essential component of the course, comparative anatomy has long since disappeared.

The Association of Basic science teachers in dentistry

The shift in emphasis concerns pre-clinical teachers. In 2017, the president of their association stressed concern at the 'dumbing down' of oral biology in contemporary integrated curricula.[16] One member described a "lack of fascination in what is being taught" and a failure of students to engage with oral bioscience topics except to pass assessments. The president recognized modern, outcome-based curricula offer advantages for contextualised teaching, illustrating the relevance of what is being taught to clinical practice. However areas of core basic science lacking direct application to the clinic, which may be eclipsed, are fundamental to developing sound, scientific foundations on which an understanding of practice is built. He emphasized the scholarship of basic dental science, which drives clinical decision-making processes, must be retained in the curricula even if its relevance is not immediately obvious. Otherwise the goals required in an outcome-based curriculum will be progressively reduced to a minimum level of knowledge necessary to perform a procedure. To avoid this he stressed his association must redouble its efforts to retain the oral biosciences as a distinct entity in the curriculum, supported by staff with the skills and passion necessary to engage the students. Far too often they hear of faculty being lost, with teaching areas unique to dentistry being incorporated into

Table 3. Some teachers of dental anatomy

WAB Brown	King's
M Hobdell	King's
KS Lester	King's
BKB Berkovitz	Bristol, King's
AR Ten Cate	Guy's
JW Osborn	Guy's
AGS Lumsden	Guy's
DA Luke	Guy's, UMDS
MM Smith	RDH, Guy's, UMDS, King's
A Haywood	RDH
HM Pickard	RDH
HJJ Blackwood	RDH
RW Fearnhead	The London
JJ Clements	The London
E Dykes	The London
A Boyde	The London, UCL
SJ Jones	UCL
ADE Shefford	UCL
BJ Moxham	Bristol
CH Tonge	Newcastle
AD Beynon	Newcastle
DJ Reid	Newcastle
ME Atkinson	Sheffield
H Noble	Glasgow
DAM Geddes	Glasgow
D Lunt	Glasgow
R Sprinz	Edinburgh
JP Shaw	Edinburgh
NBB Symons	Dundee
G McKay	Dundee
JH Scott	Belfast
PDA Owens	Belfast
DK Whittaker	Cardiff
D Adams	Cardiff
RC Shore	Leeds
J Appleton	Liverpool
MJ Trenouth	Manchester
R Browning	Birmingham
CLB Lavelle	Birmingham
WA Miller	Birmingham
E Ashton	Birmingham
C Oxnard	Birmingham

the remit of wider biomedical departments which lack sufficient understanding of dentistry to explain their relevance, and indeed have recruited retired teachers to help them (e.g. BB and MMS at KCL).

The decrease is shown in the 9th edition of Scott and Symons' Introduction to Dental Anatomy.[17] The main change mentioned in the preface is a great reduction in the quantity of comparative dental anatomy "in keeping with the amount of teaching of the subject that is now given in most dental schools in this country".

Epilogue

It is evident that vast changes have taken place since the BDS began in 1924. It is not the object of this paper to say whether this is good or bad. However, there are clearly many points to consider, especially those pointed out by the basic scientists.

Acknowledgements

Thanks are due to librarians at the University of London Senate House for locating copies of BDS regulations and examination papers, especially Amy Bowles, Special Collections Assistant. Also to Professor Mark Woolford, Dean of Education, KCL Dental Institute, for advice on current teaching requirements. Finally, Rachel Bairsto, Head of the BDA Museum Services and Helen Nield, BDA Library Manager and a variety of past students of many schools for providing some information.

References

1. Cohen, R, Birmingham Dental Hospital and School, 1858-1958. Birmingham: Board of Governors of the United Birmingham Hospitals, 1958.

2. UL, AC8/16/1/1, University of London Board of Studies in Dentistry, Attendance and Minute Book, 31 January 1901, p 1.

3. Ibid., 8 February 1901, p 2.

4. Ibid. 7 November 1901, pp 4–5.

5. Gelbier, S, Dentistry and the University of London, Medical History 2005; 49: 445-462.

6. University of London, BDS regulations 1923/24.

7. Some/all transferred to UMDS and then King's where they remain. They will form the basis of another paper.

8. Berkovitz, BK, Sir John Tomes (1815-1895): a scientific and academic legacy, Dental Historian 2018; 63: 22-32, p 32.

9. e.g. Underwood, C, Johanson, Z and Meredith Smith, M, Cutting blade dentitions in squaliform sharks form by modification of inherited alternate tooth ordering patterns, *Royal Society Open Science* 3 (11): 160385, November 2016.

10. Berkovitz, B and Shellis, P, The teeth of non-mammalian vertebrates, Elsevier: New York, 2017.

11. Berkovitz, B and Shellis, P, The teeth of mammalian vertebrates, Elsevier: New York, 2018.

12. Treaty of Rome, Article 57.

13. Appendix to, The European Primary and Specialist Dental Qualifications Regulations 1998, SI 1998 No. 811.

14. www.kcl.ac.uk/study/undergraduate/courses/dentistry-bds.aspx.

15. Woolford, M, Personal communication, 31 January 2018.

16. Bennett, J, President's Message, Association of Basic Science Teachers in Dentistry Newsletter, May 2017.

17. Scott, JH and Symons, NBB, *Introduction to Dental Anatomy,* Edinburgh: Churchill-Livingstone, 9th edition, 1982.

Authors Biography:

Stanley Gelbier Hon FFPH MA PhD FDS DDPH DHMSA (sgelbier@aol.co.uk) is Hon Professor in the History of Dentistry, Head of the Unit for the History of Dentistry and Emeritus Professor of Dental Public Health, King's College London

Barry Berkovitz BDS MSc PhD FDS (barry.berkovitz@kcl.ac.uk) is a Visiting Professor at Oman Dental College, Emeritus Reader in Dental Anatomy, King's College London, Hon Curator of the Odontological Collection, Royal College of Surgeons of England and Hon Senior Research Fellow in the Unit for the History of Dentistry, King's College London

Moya Meredith Smith BSc PhD DSc (moya.smith@kcl.ac.uk) is Emeritus Professor of Evolutionary Dento-Skeletal Biology, King's College London, a Scientific Associate in Earth Sciences at the Natural History Museum, London and a member of the Unit for the History of Dentistry, KCL

Address for Correspondence:

Prof S Gelbier, Unit for the History of Dentistry, c/o Central Office, King's College London Dental Institute, Guy's Tower, Guy's Hospital, London SE1 9RT

Dental Historian 2019 64 (1) 12-17

Charles Dickens his teeth and his dentist, Samuel Cartwright Junior

Nicholas Cambridge and Stanley Gelbier

Nature is full of teeth that come in one by one, then decay, fall out. Ann Sexton[1]

Abstract: **This paper describes the dental problems suffered by Charles Dickens, gleaned from his correspondence, and the treatments he received from his dentist, Samuel Cartwright Jr whom was also a friend and with whom he enjoyed dining.**

Key Words: Charles Dickens Samuel Cartwright Junior 19th century dentistry

Introduction

Charles Dickens (1812-70) had three professional careers: novelist, journalist and public reader. Dickens (Fig 1) was a true communicator not only through his writings but also through his lectures and readings. His other interests included crime, education and the class system. He published over a dozen major novels, many short stories (some with a Christmas theme), a handful of plays and several non-fiction books. His novels were initially serialised in weekly and monthly magazines (Household Words and All the Year Round) and then reprinted in standard book formats. Dickens wrote over 14,000 letters and they are held in libraries and collections around the world. These letters appear in the 12-volume edition of The Letters of Charles Dickens. Unfortunately, Dickens burnt the letters he received when he was living at Gad's Hill. He also took a keen interest in the medical profession. Although his medical history is better known, Dickens's dental history is more obscure and this is what we discuss below. Included is the story of his dental practitioner.

Figure 1. Charles Dickens reproduced with kind permission of The Charles Dickens Museum

Matters of the teeth

In 1841, aged 29, Dickens first wrote about his dental problems when he suffered with toothache,[2] although he does not mention what treatment he received. Many people at that time suffered from dental problems, both dental caries and periodontal disease. There were a variety of treatments for toothache, including burning the nerve with a hot wire or destroying it by caustic, cajeput oil and oil of thyme.[3]

For poor people the usual treatment was tooth extraction, often from an untrained mountebank, perhaps removed without any anaesthetic in public before an audience, whilst a drum or bugle was played to drown out the sounds of any screams. Sometimes the village blacksmith was the only available extractor. Some treatments were provided by people practising dentistry as a side-line to their normal job: physicians, apothecaries, barbers and wig-makers. Silversmiths could provide some more sophisticated treatments as they had some tools of the trade which were like those dentists use today. In some towns there were dentists trained as apprentices and others trained 'on the job'. But in that era there were no qualified dentists.

Richer people, especially in London and other large towns and cities, often relied on a surgeon practising dentistry. It was to one such surgeon that Dickens turned: Samuel Cartwright Junior. But before thinking about him, let's think about what

Figure 2. Rather discoloured denture with some gold and natural (perhaps 'Waterloo' teeth). A spring on the left hand side of the picture holds apart the dentures and thus prevented the upper one from falling down in the mouth

care was available in the mid-19th century when Dickens had his treatment.

For most people, teeth were left to rot until they became so painful that extraction was inevitable, even though that was also painful because of a lack of anaesthesia. By 1842 ether was sometimes administered via a face mask prior to dental extractions. 1844 saw Horace Wells have his own tooth extracted whilst under the influence of nitrous oxide (Laughing gas). All such attempts at early anaesthesia were dangerous, in some cases with fatal results. Local anaesthetic injections would not have been available to a young Dickens. Only in 1885 was the use of cocaine demonstrated.

When teeth were not too badly decayed the carious dentine was sometimes removed by scraping with hand instruments. Then a variety of drills operated by hand or clockwork were introduced. Only in 1871 was a foot drill invented, long before the advent of electrically operated drills. All such treatments would have been uncomfortable, with much vibration, pressure and inevitably pain.

Then came the question of what to put in the cavity to keep out food and debris. From about 1830 Royal Mineral Succedaneum amalgam made from filing silver coins was used. 1848 saw the introduction of a silver-tin mixture which was amalgamated with mercury.

Rich patients sometimes had gold foil fillings: gold leaf was built up in the cavity, layer on layer. Each layer had to be literally hammered into position to make it coalesce with the previous layer.

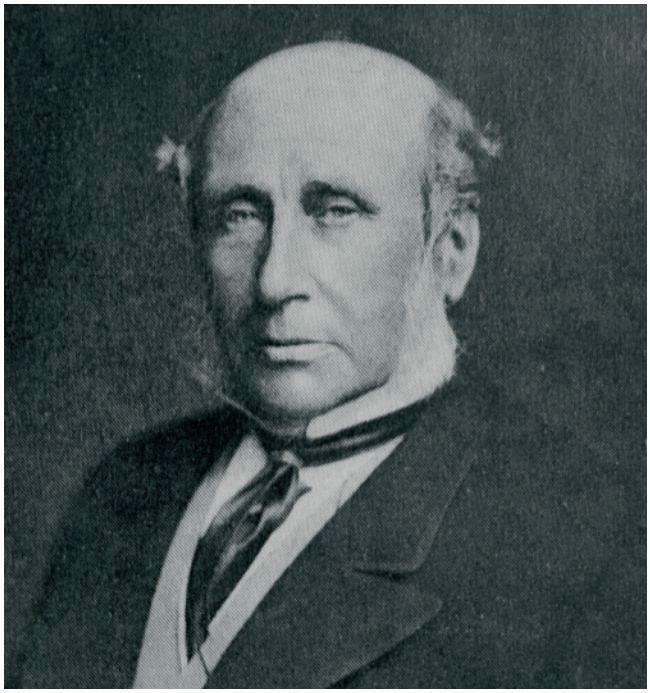


Figure 3. Samuel Cartwright Junior

With loss of teeth there came the possibility for some wealthy patients to buy dentures. Before the 1850s dentures were made of very hard, and very expensive material, like swaged gold or carved ivory. The invention of vulcanite hard rubber changed everything. In 1843 Charles Goodyear discovered how to make flexible rubber from India rubber (caoutchouc). By 1851 his brother, Nelson, patented an improved manufacturing process to produce hard rubber vulcanite. It found instant use in the construction of denture bases and quickly replaced previously-used materials as it was mouldable, could be precisely fitted and was relatively cheap. Ivory dentures cost 25 guineas (a year's wages for a housemaid), vulcanite dentures cost six guineas. By luck vulcanite dentures became available just after the introduction of anaesthesia. People who had preferred toothache to the pain of extraction were now prepared to have their rotten teeth removed, creating a demand for dentures. For the first time false teeth were no longer a luxury only rich people could afford. They were available to the middle classes.

Springs sometimes joined the upper and lower dentures to help keep the former from falling down (Fig 2).

The teeth on these denture bases came from a variety of sources. Some were made of porcelain. A platinum pin was embedded in the back of each artificial tooth and this was soldered onto a base.

Then there were Waterloo teeth, originally harvested from bodies at the battle of Waterloo; and later from corpses in graves.

Samuel Junior and the Cartwright family of dentists

From 1853 onwards Samuel Cartwright Junior (Fig 3) became Dickens's regular dentist and a private friend with whom he enjoyed dining.[4]

On one occasion Dickens remarked 'I went out at 7 o'clock to dine with Cartwright (I always feel a strange satisfaction in doing at least that much to my own teeth in his house), and could hardly get out at my own door, or at his.'[5]

Later in 1855 he writes 'I am going to Cartwright at 2 o'clock tomorrow (he wants to chip for half an hour or so at my teeth, like Old Mortality at the tombstones) '.[6]

But who was Cartwright?

Samuel Cartwright Jnr was one of a family of leading dentists.[7] He was the son of Samuel Cartwright FRS (1789-1864), also a surgeon-dentist. Amongst his patients was King George IV, from whom he seemed to earn much money – but waited a long time for it (Table 1). It will be noted that Cartwright had to wait a long time before the King paid his bill.

Cartwright Junior was born in 1815, the year of the Battle of Waterloo. He studied at Trinity College Cambridge and then went to the London Hospital for clinical training, gaining the MRCS in 1838. Cartwright then went into practice.

In 1844 Cartwright Jnr became surgeon-dentist to King's College Hospital, founded in 1840 in Portugal Street, close to both King's College London (KCL) and the Royal College of Surgeons (RCS) of England. At the same time, he was lecturer in dental surgery and pathology to the medical students. Most of the hospitals in London were established to provide treatment, often for the poor. Later, students visited them to gain clinical experience. King's College Hospital, on the other hand, was uniquely founded by KCL to provide clinical experience for its medical students and instruction from their own professors. The surrounding area consisted of overcrowded slums, poverty and disease. Within two years of opening, the hospital treated 1,290 inpatients in 120 beds. It was managed by the Council of KCL so was an academic institution from the beginning. Because of this relationship KCL could elect some senior hospital staff to a chair or professorship. Thus, in 1860, Samuel Cartwright Junior became the UK's first professor of dental surgery. As did his father and son, he also worked at the Dental Hospital of London and Great Ormond Street Hospital for children.

Cartwright was much concerned with the future of dentistry, which he felt should be part of surgery. He worked with John Tomes and others to ensure the English College of Surgeons established a Licence in Dental Surgery qualification (LDS). To do so they established the Odontological Society of

Table 1. Items from George IV's accounts

Samuel Cartwright's (Dentist) Bill for attendance upon the King from 1 Jan 1829 to 17 Dec 1829:

29 visits to Windsor by arrangement, 20 guineas per visit	609
8 visits to St James's with detention more than 14 hours at the Palace, (3 guineas per hour}	42
Mechanical	50
	====
	701
From 21 Jan to 3 Jun 1830, 5 visits	105
	====
	£806

[
The Bill was paid by Wellington and Knightson on 14 July 1830]

London (1856) and the Dental Hospital of London (1858). The first president of the Society was his father, Samuel Cartwright FRS. Cartwright Junior was president twice (in 1863 and 1877) of the re-vamped Odontological Society of Great Britain.

The RCS examined the first students for the new qualification on 13 March 1860. On the list of passes was Samuel Cartwright Junior. From 1865 to 1875 he acted as an examiner for the LDS.

Cartwright was also president of the Association of Surgeons practising Dental Surgery, a group established to further the interests of surgeons who practised dentistry. They founded a prize to commemorate his efforts to improve the status of the dental profession. The prize, consisting of a Cartwright Medal in bronze and an honorarium of £85, has since been awarded quinquennially to the author of the best essay upon a subject relating to dental surgery; now taken over by the RCS England. Many of his presentations appeared in the Odontological Society's Transactions and the British Journal of Dental Science. Cartwright was a keen musician: a member of several musical societies; and he was a talented artist (Fig. 4). He had retired for some years when he died on 23 August 1891 at 32 Old Burlington Street [where he was born].

His son, Samuel Hamilton Cartwright MRCS Hon DDS (NY) (1842-1907), succeeded his father as dental surgeon and lecturer to the Dental Hospital of London. He became professor of dental surgery and consultant at King's in 1875.

Back to Dickens

In 1856, Dickens had a tooth extracted[8] and in 1860 he wrote to Cartwright requesting 'some of your skilful overhauling.'[9] By 1867 a loose back tooth had fallen out[10] and two months later Dickens wrote to Cartwright requesting him to tighten up some loose teeth.[11] This would suggest that Dickens was suffering from periodontal disease, perhaps associated with his increasingly poor health. One wonders if his teeth were scaled to remove calculus and perhaps wires were placed to bind loose teeth against those which were firm. But the remarks below suggest two dentures. A few weeks later Dickens wrote to Cartwright and said 'I cannot but think when I come to consider these nice constructions [so more than one denture], that we must have been hurriedly below the mark of their cost this afternoon. Therefore, I have made a cheque for Fifteen Pounds, and now enclose it with Fifteen thousand thanks.'[12]

Figure 4. Drawing by Samuel Cartwright Junior from Cartwright's album of drawings in the BDA Museum. It has the following words below it: 'Take care Sir! If you drive so nigh a chap you will be run'd over one of these days'

Later that year Dickens appears to have had problems with his voice. Conscious that he would soon be on his reading tour of America, accepted Cartwright's offer to see him. Dickens writes: 'It is very kind of you to offer your great skill in aid of my "Speaking department", and I thankfully accept the offer.'[13] Poor dentures may cause difficulties when talking, either because they are bulky and prevent the tongue moving properly or they keep moving – perhaps the upper one falling down?

A month before set sailing to America for his reading tour, Dickens wrote to Cartwright as he was having problems with fixing the dental plate into his mouth with his hands and asking him for his kind assistance.[14] Three weeks later, and shortly before departing for America, Dickens wrote to Cartwright again about his dental plate and said 'I wore IT all day yesterday with great success. To-day cannot get it in. It appears to be penitent undersigned that the left wire may be a little too long.'[15] Dickens wanted to be free of any dental problems whilst he was away and continued 'He himself casts himself on your merciful consideration, and forlornly represents that he can't come to you when 4,000 miles off.'[16] Clearly this was a partial denture, with wire clasps to help retain it in the mouth.

Unfortunately, Dickens developed problems with this dental plate (which usually refers to an upper denture) during his arduous five months

reading tour of America from November 1867 to April 1868. He gave 76 readings at numerous venues including New York, Portland, Washington, Boston and Buffalo, travelling from place to place by train. Dickens first experienced problems with his denture in January 1868 and wrote to Cartwright:

What was my horror at New York one night to find the light plate you so kindly made me, useless, and nevermore [to] be fixed by any skill of mine!!! I took it straight to one Mr. Lefler, (I mean that the L-E-F-L-E-R) a dentist who was recommended to me. He said "to couldn't fix it, - but it didn't seem to me that he particularly tried. As he thought "That he could fix me another on the atmospheric principle", I consented to his making one – which he did, and it acts fairly. Finding that I could read without any as I always used to do, I have since read so. But what were my emotions the other day to find my faithful heavy plate, that charming instrument which had become part of myself and served me through all sorts of dinners-suddenly give in, in the same manner, and positively refuse to be coaxed or compelled into any adjustment whatever!!! I have put the two by carefully, and shall fly to you (like young, Norval's Shepherds) "for safety and for succour" in the earliest hours of my return to England.[17]

The words 'atmospheric plate' suggest an upper denture held up by suction, relying on a good fit. Sometime a suction pad was added to the palatal surface of the denture, the created vacuum holding up the plate against the palate.

It is highly likely that Dickens consulted Cartwright on his return to England although there is no mention of this in his letters. The first mention of Cartwright is in a letter dated 2 July 1868 when he says that he is 'engaged to dine with Cartwright tomorrow.'[18] The first reference to having dental treatment occurred on 21 October 1868[19] although we are not informed what treatment Dickens had received. However, in a letter dated 30 November 1868 Dickens writes:

I have not reported sooner, because at first I could not put the new plate into position; and knowing that to be the fault of my hands, and not of yours, I waited to overcome the difficulty. I can now handle it easily, and it is so very nearly perfect that there is nothing to trouble you about. Will you kindly let me know (at 26 Wellington Street) for what amount I may send you a cheque? You remember our compact. Material and workmanship are to count.[20]

Dickens was now on his Farewell Reading Tour and gave a reading on the Carol and Chops at St James's Hall, London on 1 December 1868. The following day he wrote to Cartwright and said 'Conscience money enclosed,[21] with a thousand thanks. I read with the new plate last night, quite easily and comfortably'. No further dental visits were recorded in his letters. Dickens died on 8 June 1870 from a severe stroke ['apoplexy' was the Cause of Death on Dickens's death Certificate] at his home in Gad's Hill, Kent. He was buried in Poets' Corner in Westminster Abbey on 14 June 1870.

Acknowledgements

Thanks are due to Helen Nield, Head of Library and Knowledge Services and Rachel Bairsto, Head of Museum Services at the British Dental Association, both of whom gave invaluable advice.

References

1. Anne Sexton, The complete poems, Houghton Mifflin, Boston 1981, The Wall, p. 445.

2. Madeline House and Graham Story eds. The Letters of Charles Dickens, 12 vols, The Clarendon Press, London, 1965-2002, vol.2, p.224, [?4 or 5 March 1841]. Hereafter abbreviated to Letters.

3. Robert Hooper, Medical Dictionary, London, 1848, p.950.

4. Letters vol.7, p.27, 24 February 1853. Samuel Cartwright, Jnr (1815-91); Trinity College, Cambridge 1832, MRCS 1838, FRCS 1859; dental surgeon in practice in 32 Old Burleigh St.

5. Letters vol.7, p.528, 8 February 1855.

6. Letters vol.7, p.615, 10 May 1855.

7. Gelbier S, Great Ormond Street Hospital, its dental surgeons (1856-1946) and the Cartwright family, Dental Historian 2010; 51: 48-65.

8. Letters vol.8, p.42, 5 February 1856.

9. Letters vol.9, p.205, 3 February 1860.

10. Letters vol.11, p.324, 2 March 1867.

11. Letters vol.11, p.360, 1 May1867.

12. Letters vol.11, p.370, 22 May 1867. £15 in 1867 is equivalent to £975 today.

13. Letters vol.11, p.404, 26 July 1867. It must be remembered that Cartwright was a Fellow of the Royal College of Surgeons and had the Chair of Dental Surgery at Kings College, London.

14. Letters vol.11, p.450, 8 October 1867.

15. Letters vol.11, p.466, 28 October 1867.

16. Ibid.

17. Letters vol.12, p25, 29 January 1868.

18. Letters vol.12, p.145, 2 July 1868.

19. Letters vol.12, p.206, 21 October 1868.

20. Letters vol.12, p.228, 30 November 1868.

21. Letters vol.12, p. 230, 2 December 1868. CD sent him a cheque for four guineas, debited on 8 Dec (CD's Account-book, MS Messrs Coutts).

Authors Biography

Nicholas Cambridge MD MRCS FSA FLS FR*SA, Honorary Research Fellow in Humanities and Medical History, the University of Buckingham. Nicholas Cambridge qualified as an electrical engineer in 1970 and then decided to become a doctor. He qualified from The Middlesex Hospital in 1977 and as a student won the first history of medicine prize offered by the Royal Society of Medicine. After a variety of clinical posts Nicholas became a family GP in Surrey for twenty-five years. Whilst still running a busy practice he obtained his MD in medical history working part-time at The Wellcome Trust Centre of the History of Medicine at UCL. He later retired in order to pursue his interests in medical history further. In 2017 he gave a lecture on Charles Dickens to Gresham College, London and was invited to be the Dr T J (Jock) Murray Visiting Scholar in Medical Humanities at Dalhousie University, Halifax, Nova Scotia, Canada. He is a member of the Dickens Fellowship and has published two papers in The Dickensian Journal. He is Chairman of the Erasmus Darwin Foundation, Chairman of the William Shipley Group for RSA History, Chairman of the Charles Bell Group to preserve the legacy of The Middlesex Hospital, Chairman of The Middlesex Hospital 2019 Celebrations Committee and a Vice President of the Johnson Society of London. He is a Past President of the History of Medicine Section of the Royal Society of Medicine, Past President of the Hunterian Society and Past President of the Medical Society of London He is the Honorary Editor of The Medical Society of London Transactions and a Trustee of the Medical Society of London.*

Stanley Gelbier Hon FFPH MA PhD FDS DDPH DHMSA (sgelbier@aol.co.uk) is Hon Professor in the History of Dentistry, Head of the Unit for the History of Dentistry and Emeritus Professor of Dental Public Health, King's College London

Address for Correspondence:

Dr N.A. Cambridge (nacambridge@hotmail.com)

Dental Historian 2019 64 (1) 18-19

General Anaesthesia at Brown's Dental Surgery, Parliament Road, Middlesbrough 1918-2001

Tony Brown

Abstract: This is an account of how general anaesthetics were provided by three generations of dentists working in the same general dental practice over an 83 year time period.

Keywords: General anaesthesia, dental practice, Middlesborough

Thomas Brown, (1879 – 1954)

My grandfather, Thomas Brown, was a 1921 Dentist[1]. He opened his own full time dental practice in 1918 in a rented house at 41 Parliament Road. It provided combined living and practice accommodation for him, his wife Mabel and their only child Thomas Henry (1906 – 1993). Most extractions were carried out under local anaesthetic at the practice. However occasionally Tom would arrange for the patient's general medical practitioner to accompany him to the patient's home and administer a general anaesthetic (GA) for a dental clearance, with the patient lying flat on the kitchen table. This GA would be either using ether or chloroform dripped onto a cloth over the patient's nose. An arrangement like this had recovery advantages for the patient, but bearing in mind the quantity of blood, probable lack of suction or emergency oxygen combined with the relative inexperience of the administrator, it must have been a potentially hazardous operation.

Figure 1. This central stand is all that remains of the practice Walton 1 anaesthetic machine which was bought by the partners in 1929

Thomas Henry Brown (1906-1993)

His son, Thomas Henry, went to dental school in Newcastle upon Tyne in 1923. In anticipation of him joining the family practice, in 1925, Tom bought two adjacent terrace houses at 35/37 Parliament Road, with No.35 used exclusively as the new practice premises and No.37 let, but with future expansion in mind. Tom qualified L.D.S. (Dunelm) in December 1928. Having been trained in the administration of dental general anaesthesia it was decided to buy a Walton 1 anaesthetic machine, the stand from which forms the basis of this study (Fig 1). Tom Senior would carry out the extractions whilst Tom Junior administered the anaesthetic. At the same time an emergency kit containing ampoules of Amyl Nitrate and a tracheostomy kit complete with a silver tracheostomy tube was bought and this also survives (Fig 2). The anaesthetic belt for securing patients sitting upright in the dental chair but with a quick release buckle for safety, a gag and pre-stainless steel, plated steel forceps come generally from this period. All items except the forceps were used until the demise of general anaesthesia in general dental practice, by legislation, in 2001.

Sometime in the late 1930s or early 1940s a Walton 2 anaesthetic machine was bought and this was in use with a Trilene vaporiser in 1962 at the time of my entry into the family dental practice. In 1937 the father and son bought and moved the

Figure 2. The emergency kit was bought at the same time but thankfully has never needed to be used

practice to 44/46 Parliament Road knocking the two premises into one building and the practice continued here until the retirement of the author in 2004 when it was sold and converted into a ten bedroom student accommodation.

During the Second World War when many medical staff had been called up for active service, Tom Junior worked part time at Middlesbrough General Hospital. He administered the shorter anaesthetics thus releasing the reduced regular staff for more complicated procedures, many former staff having been called up into the armed forces.

Tony Brown (born 1940)

When I joined the practice in 1962, my father would administer general anaesthetics on the Walton 2 machine with the patients sitting upright in the dental chair whilst I carried out the extractions. Particularly in the case of oversized male patients who had been accustomed to a large and regular dose of alcohol, anaesthetic induction even with the addition of Trilene was very difficult and was probably only achieved by means of hypoxia and by accepting a very turbulent and physically active anaesthetic. I had always felt that the administration of GA was very much a specialist field into which I did not want to venture, so GA was suspended until I acquired the services of part-time consultant anaesthetists who could ensure a safe and well-controlled anaesthetic.

The late Dr. Harold G. Saunders was my regular anaesthetist. He visited the practice once a week for a short extraction list of perhaps 6 to 10 patients, apprehensive children needing a small number of extractions of deciduous teeth or first permanent molars and even more apprehensive adults needing the odd extraction or increasingly infrequently a clearance before the fitting of full dentures. His anaesthetics were calm and controlled using an intravenous induction where necessary and the addition of Halothane from a vaporiser and gave great confidence to the onlooker. Between us we developed techniques for carrying out extensive conservation work, unusual at this time, on physically or mentally impaired adults and we treated one patient like this per anaesthetic session. Dr. Saunders developed the use of a well lubricated introducing cannula which he inserted into the nose and pulled the loose end out over the tongue. His nasal endotracheal tube could now be inserted into the bell-end of the introducing cannula and pushed forward as he removed the cannula from the mouth. He used his laryngoscope to complete positioning of the endotracheal tube in the usual way. This enabled him to use a significantly larger nasal tube without damage to the delicate nasal passages whilst leaving the oral cavity free for easier access for the dental work, particularly important when conservation was envisaged. He further protected his airway by the use of tampons pushed well back in the mouth. As these became damp from the dental air-rotor cooling spray they swelled as designed to do, thus sealing off the mouth more effectively than the use of standard throat packs.

Dr. Saunders very soon found us a Walton 5 machine which, as he was a very practical man, he kept in good order, replacing deteriorating parts as necessary, supervising a modification to allow the fitting of longer oxygen and nitrous oxide cylinders and adding pin-index fittings when these became essential for the safe installation of cylinders on the correct yoke. Eventually in 2001 legislation was introduced to stop the administration of general anaesthesia outside the hospital environment and this resulted in considerable demand difficulties as the necessary additional hospital facilities had not been put in place in advance of the legislation.

Reference.

1. Dental Historian 52, July 2010, pages 9 – 19.

Author Biography

Tony Brown is a retired general dental practitioner who worked in Middlesborough.

Address for correspondence:
berony63@virginmedia.com

Dental Historian 2019 64 (1) 20-24

Post-1948 Oral Hygiene Services for Children

BA (Polly) Munday and Stanley Gelbier

Abstract: When the NHS started in 1948 dental disease in children was rife and little treatment was received, let alone prevention. This paper examines how preventive care was slowly developed, especially through school dental services.

Keywords: Dental health, Oral hygiene, School dental services, Royal Society of Health

The post-World War 2 situation

The ending of the War in 1945 was wonderful, but along with housing and basic shortages, the condition of the nations' teeth was cause for great concern. The state of children's mouths became terrible, especially after sugar-rationing was abolished in 1953. Sugar products became widely available, there was a lack of awareness of oral hygiene and the NHS system of dentistry for children did their worst for dental health. We mostly think of the harm from sweets, cakes, and biscuits but even in the 1960s there was a problem from fizzy drinks. A 1962 paper reported a patient who consumed a mass of cola and other fizzy drinks, much sprayed through a straw onto the teeth. The enamel was dissolved by the acid and then became carious. This was probably the first reported case. People are still acknowledging these drinks cause trouble. We take a long time to learn.

Throughout the 1950s and 1960s teeth were decimated. In 1965, 90 per cent of children had caries; 1963 saw 11.2 million teeth extracted; and in 1965 there were half-a-million GAs for 5 to 15-year-olds. Something had to be done?

NHS General Dental Practice

In the early days relatively few children received therapeutic treatment let alone prevention. They were often not taken to a dentist until forced by toothache. Some mothers thought they couldn't afford dentistry for their child although it was free from General Dental Practitioners (GDPs) as well as school clinics.

In the 1940s, 1950s, 1960s and 1970s GDPs were overwhelmed by adult patients, many with neglected mouths, never or seldom having visited a dentist. To make matters worse the NHS paid dentists less for treating children, so many were refused appointments, few undergraduates learned how to treat children properly, many dentists left the school dental services (SDS) to work in the more lucrative general dental service and others didn't return after the war. Something had to be done.

School dental inspections and prevention

School inspections were invaluable to locate children needing treatment. They gave dentists a chance to advise parents of need via messages sent home. Surveys provided local authorities with information on the need for services. Immediately post-war there were insufficient school dentists to inspect most children, let alone provide treatment. Aware of the problem the government tasked the new General Dental Council with investigating the role of New Zealand school dental nurses.

New Zealand dental nurses

At the end of WW1 there were severe dental problems in New Zealand: 90 per cent of children needed treatment. In 1919 the government advertised for qualified dentists but it was a year before any were appointed. Colonel T A Hunter CBE, formerly Head of the Military Dental Service, was appointed as Chief Dental Officer to the Education Department. He realised most dentists were occupied in treating adults so couldn't cope with the massive problem of children's teeth. Hunter recalled a suggestion by Norman K Cox about the use of specially trained female nurses. Cox, President of the NZ Dental Association in 1913, called for "compulsory dental prophylaxis for school children" and advocated a system of State dentistry for children aged 6 to 14 years in school clinics. He shocked dentists by proposing that Otago Dental School should introduce a "fairly short course" for people whose sole role would be to care for children. Although Cox received support for a system of State dentistry there was strong condemnation of short courses, seen as "a menace to the public and the profession, and an injustice to prospective dental students".

The first 30 "probationer dental nurses" started their two-years training in 1921. Twenty-one females aged 20 to 36 years completed the course. Hunter felt strongly that women were temperamentally and psychologically more suited than men to deal with the treatment of ailments in very young children. These nurses provided the first point of contact with patients with referral to a dentist if a nurse felt advice or additional treatment was needed. Nurses generally worked near their home areas.

UK School for Dental Auxiliaries

Following passage of the 1956 Dentists Act a General Dental Council was established. During parliamentary debates it was agreed that one of its first actions should be to establish an experimental dental scheme following an investigatory trip to New Zealand. The 1957 Dentists Act included provision for an experiment on the training and employment of ancillary dental workers to fill teeth and extract deciduous teeth in national and local authority health services; and to assess their value. On 6th January 1958, members of an Experimental Scheme Committee were appointed by the General Dental Council (GDC) with four additional people appointed by the Privy Council. The committee met on 29th January and soon agreed plans for a dental auxiliary school. The School for Dental Auxiliaries (called therapists from 1979) opened in 1960 in the grounds of New Cross Hospital in south London.

School dental services

Auxiliaries plus increasing numbers of (especially younger) dentists brought gradual improvements. Apart from much required treatment, there was a need to educate mothers to encourage effective brushing in infants. Free treatment for mothers from GDPs and school dentists exposed them to dentists' messages. However, many stopped going once their own treatment was no longer free. And if mums didn't go for treatment because of the cost, they were embarrassed to take their children. Gradually school services increased many aspects of care including: chair-side education, polishing children's teeth, application of fluorides and later fluoride varnish. Water fluoridation in a few areas and stannous fluoride toothpastes from the early 1970s became important. One problem was that the upper social classes bought most brushes and paste, and later fluoride tablets, but their children were the ones who had less disease. Furthermore, some of them developed fluorosis from the over zealous use of fluoride tablets.

These activities led to administrative problems. In 1962 the Ministry of Health set up an inspectorate to ensure school services provided value for money. On a 3-year basis they analysed statistics from services and sent an inspector to interview the chief dental officers (CDO), dentists and other relevant people. In one case (Hackney) a follow up letter to the town clerks (the borough's chief executive) criticised the chief dental officer (SG) for allowing dentists to spend much time on prevention instead of treatment as there was a backlog of need. Increasingly in the 1960s this and some other services provided health education in centres for handicapped adults and mothers' clubs. This care for non-child groups also upset the Ministry which pointed out that local authority budgets were meant only for children, expectant and nursing mothers. Fortunately the town clerk and medical officer of health (to whom the CDO was accountable) supported his stance on all these issues. But why were there inspectors?

The Ministries of Education and Health

A 1962 parliamentary committee was established to examine if GDPs provided value for money. Pressure from the General Dental Practitioners Association diverted attention to school services. The committee's report was introduced in the Commons by its chairman, Sir Eric Errington MP. He said they were deeply concerned with school services. There seemed to be a lack of drive and knowledge of the responsibilities and importance of its work. It aimed to inspect every child annually, to offer treatment to those needing it and to treat all who accept its offer; but it couldn't be attained. Only half of children were inspected, half of those needing treatment got it through school services and the situation was getting worse: in 1938 it was 32.1 per cent; in 1947, 29.7 per cent; in 1962, only 17.4 per cent. It was disturbing that there was "no tie-up at all with the Health Service".

The report reminded MPs that school services relied on ageing dentists, many part-timers and newly qualified dentists who stayed for a short time until becoming GDPs. Part-timers, "often married women with domestic responsibilities", meant

services were often organised on a sessional basis with a lack of productivity.

The chairman said it was extraordinary that with seven million children in the country the Ministry of Education had only one dental officer to look after them, "and he preferred to call himself a medical officer". This showed the "Cinderella position of the dental services". The committee recommended that responsibility for school services then exercised on behalf of the Minister of Health by the Minister of Education should be assumed by the Minister of Health. Sir Eric said it was a modest proposal with convincing arguments, but it was too revolutionary for the Minister of Health: the recommendation was initially rejected out of hand. However, although the actual services remained with local authorities until transferred to the NHS in 1974, responsibility was transferred to the Ministry of Health in 1962 and dental officers were appointed to investigate local services. One criticism was that no-one knew how much work was being done by the SDS as there was no official record system. The Ministry's CDO, Admiral William (Bill) Holgate, had to hurriedly introduce an information system, so used one he was familiar with: that used by the Naval Dental Service (which he had previously headed). Unfortunately it meant that SDS activities could then not be compared with those of GDPs.

Origins of school services and prevention

The role of school services was essential in providing education outside surgeries, especially where parents were less aware of dental needs. Teeth assumed importance in the Boer War when 6 per cent of men were rejected for dental, reasons, including some seeking commissions. It wasn't only teeth which were poor. There were three important reports, from the Royal Commission on Physical Education (Scotland) (1903), Interdepartmental Committee on Physical Deterioration (1904) and the Committee of the Board of Education on Medical Inspection and Feeding of Children Attending Public Elementary Schools (1905). Particularly important was the 1904 report. Following their publication it was agreed to increase care for children, to improve the nation's general health. A 1906 Education Act allowed the provision of free school meals but the *British Dental Journal* questioned its value, when so many children had *no* remaining teeth or so much decay to make eating difficult.

A 1907 Education Act allowed the development of publicly-funded school health services, including dentistry. The *BDJ* proclaimed: medical inspection of elementary school children must include a dental exam but emphasised inspection without treatment wouldn't solve the problem. There were also worries about focal sepsis, toxins from decayed teeth affecting other parts of the body. Dr Weaver, Southport's MOH, asked his education committee to do something about children's teeth as those with chronically septic mouths were liable to many diseases. He said poor country children presented a picture of health, with rosy cheeks and bright eyes. But scarcely a single mouth had sound teeth. There was a growing cry for more dentistry for *the* poor.

A number of small local services developed. In 1906 George Cunningham convinced his patient, Sedley Taylor, a Cambridge academic, to finance the Cambridge Dental Institute for the treatment of children. It was later taken over by the borough council as the first clinic of its school dental service. By 1909 there were also dentists at clinics in Bradford, Chester, Coventry, Hove, Kettering, Great Crosby Lancashire, Norwich, Reading, Sheffield, Torquay and Worthing. The London County Council supported the growth of school dentistry in the early 20th century. In 1910 Frederick Breeze was the first London school dentist, in a converted public house near Waterloo. His dental nurse taught oral hygiene to groups of children. An LCC school in Islington had regular dental education sessions and a toothbrush club where children saved money weekly to buy a brush, perhaps as a present for mum's birthday.

Some later developments

Over time many School Services (re-named Community Services from 1974) expanded their activities, using dentists, dental surgery assistants (nurses), auxiliaries and occasionally hygienists for Dental Health Education (DHE). As some staff became full-time educators there developed a new group of workers – dental health education officers. Some joined general health education teams, which in turn learned about common risk factors associated with diet and smoking.

Support from industry

Some enthusiastic chief dental officers leading school services strove to increase health education but their over-stretched local authorities seldom had enough money to take on board many of their ideas.

From 1952, major support came for D &W Gibbs Oral Hygiene Service, led by H Colin Davis and his lecturer, Doreen Land. A separate paper discusses its origins and activities.

Apples and Pears Council

There was some support from the Apples and Pears Council, which provided leaflets on the benefits of eating fruit. At one time the chef Robert Carrier, with whom he worked, arranged for Pierre Picton, Pierre the Clown, to perform for the Council. It employed him to work with local school dental services. For over 40 years Pierre (born Peter) was one of Britain's most popular circus performers, with a battered 1918 Model T Ford - an old Mack Sennett Hollywood prop from the glory years of silent film comedy. The Apples and Pears Council employed him to front their dental health campaign for children. He went into schools where, amongst other things, he got children to sing: "Today we had a visit from Pierre the Clown; now we brush our teeth up and down". Pierre memorably handed an apple to John Lennon at the opening of the Beatles' Apple Boutique in London in 1967. In 1968 he worked as a driver on the film Chitty Chitty Bang Bang, later buying the car at auction. In Hackney, it is recalled (by SG) that he returned to the service's office in between school visits to check on his fish and chip business and Radio Brighton, for which he had phone-in sessions. During the drive he often asked for the car to stop so he could rush into a fruit shop and hand some leaflets to the bewildered shopkeeper. The Apples and Pears Council commissioned a special poster in typically sixties lurid blues, reds and yellows: "*Pierre the Clown says End you meal with an apple. It's nature's toothbrush".*

The Royal Society of Health

In about 1973 the need was realised (by SG) for improved knowledge and communication skills for dentists and their staff and to equip teachers and others with dental knowledge. Few mothers-to-be and young mothers visited a dentist regularly. Many accepted advice on other health matters from ante-natal clinics, health visitors and nurses, but few such staff had real knowledge of oral health. SG was then a member of the Royal Society of Health's Dental & Allied Group committee chaired by Colin Davis and convinced him of the need to educate all these people: the RSH was enormously supportive. Thus the first health education learning programmes leading to a dental qualification - the Diploma in Dental Health Education - came into being. People attended one-year part-time courses around the UK. To ensure high standards these courses had to be approved by the RSH after visits from a pair of inspectors. The first exam was held in 1976. Students took written exams and an oral to demonstrate their communication skills as well as knowledge. This is where some dentists had difficulties, with poor communication abilities.

A proud RSH informed the GDC of this advance. Its reply reminded the RSH that dental education is the province of dentists. The RSH in return reminded the Council that education is what teachers do. Eventually the president of the GDC said dentists could let their surgery staff do DHE provided they were convinced of their knowledge and abilities. But, he said, only dentists could put their fingers into children's mouths to show them what to do. The diploma was later taken over by Nottingham University as its Certificate in Oral Health Education. Then finally, it was validated by the Business and Technology Council (BTEC) at level 3 which is equivalent to an A level.

The Scientific Basis for Dental Health Education

In the early years, the messages and advice given to children and the public (e.g. *Swish and Swallow, Clean Your Teeth with an Apple*) had little proven scientific basis. However in 1976, Cathy Stillman-Lowe and Ronnie Levine produced *The Scientific Basis for Dental Health Education*, published by the Health Education Council. It aimed to provide proven messages that could confidently be communicated to the public. This was especially important when 'teaching the teachers', including health visitors and nursery nurses. Now in its 7th edition, it complements *Delivering Better Oral Health: an evidenced based toolkit for prevention.*

Developments by school dental staff

Over time school and community staff became efficient and adventurous in their methods of educating children. For example some services provided puppets shows which were invariably discussed with parents, so the messages got home. Figure 1. shows puppets produced (by BAM) for the Lambeth, Southwark and Lewisham Community Dental Service.

Figure 1. From left, 'the baddies' Jimmy Germ and Stanley Sugar, the innocent Sammy Molar, the good Mrs Fluoride Toothpaste and the kind Ms Dentist. Mr Toothbrush is lying down whilst they all watch Percy Plaque.

Sure Start scheme

Sure Start was a national initiative introduced in 1998 by the Chancellor of the Exchequer, Gordon Brown. It was designed to give children "the best possible start in life" through improved care, with an emphasis on outreach and local community developments. Dental screening data was decisive in helping some areas to bid for Sure Start funding, to reduce inequalities in the oral health of under-fives. In Southwark we used a bid to fund a Sure Start dental worker for the tough Aylesbury estate at the Elephant and Castle. She worked alongside health and education colleagues to facilitate the inclusion of vulnerable young children and their families into dental health care.

Forward to 2018

Over many years school services made an enormous contribution to children's dental health. By the time we retired oral health was enormously improved but now the situation has reversed. Extractions are nationally the leading cause of hospital admissions for 5 to 9-year-olds. Over 23 per cent of children starting primary school in England now have decayed teeth. It is a disgrace that 7 per cent of five-year-olds in Tower Hamlets have already undergone tooth extraction.

One issue is inequalities. Jeremy Hunt's (the former Secretary of State for Health) prosperous Surrey constituency is the place for children to grow up decay-free. Children in reception classes in Waverley have twenty times less decay than those in Pendle, in the North West. In Pendle, 49.5 per cent of children have decayed, missing and filled teeth; it is 5.4 per cent in Waverley. Postcodes and parents' incomes continue to dictate oral health. There is unnecessary pain, distress and a huge drain on the health service.

So what will it take to turn the tide again? All this at a time when community dental services have been decimated in most parts of the country. A future history historian might answer the question.

Reference

1. Delivering Better Oral Health: an evidenced based toolkit for prevention, Public Health England, 3rd edition 2017.

Author biography

Stanley Gelbier (sgelbier@aol.co.uk)

Professor and Head of the Unit for the History of Dentistry

Polly Munday (mundayclan@gmail.com)

Hon Research Fellow and previously Senior Oral Health Advisor (Educator), King's Community Dental Service

Corresponding Author

Prof S Gelbier, Unit for the History of Dentistry, c/o Central Office,

King's College London Dental Institute, Guy's Tower, London SE1 9RT

Dental Historian 2019 64 (1) 25-26

Born with teeth

Xavier Riaud

Abstract: A description of some notable historical figures who are reported to have been born with natal teeth.

Keywords: Natal teeth

Introduction

Natal teeth are small tooth like structures found in the mouths of some babies at birth. They are not very common and tend to be mainly located in the lower incisor region of the mandible but can also occur in the maxilla.

Titus Livius gave an early desciption of these structures in cuneiform written texts in 59 B.C. In 23 B.C. Caius Plinius Secundus the Elder thought that boys born with teeth were likely to have a bright future, while by contrast, girls with natal teeth were likely to have a disastrous life.

The following historic people are said to have been born with natal teeth: Hannibal, Robertus Diabolus, Richard III of England, Carlos Prince of Asturias, ill-fated son of Philip II of Spain, Mazarin, Louis XIII of France, Louis XIV of France, Mozart, Mirabeau, Danton, Napoleon, Loulou, son of Napoleon III.

Shakespearean quotes

In addition to the well known historical figures reported to possess natal teeth, the following references can be found in the literary works of the Shakespearean Play, Richard III (1623).

The following extracts refer to natal teeth:

"… they say my uncle grew so fast that he could gnaw on a crust at two hours old .."

and ".. a hellhound [Richard III]… that had his teeth before his eyes…."

Henri IV of France

Henri IV of France is said to have been born with teeth.

"As soon as Henri IV was born, his grandfather rubbed his lips with garlic and put a drop of wine in his mouth."

The child was said to have had eight successive nurses, which was one less than Louis XIV of France.

Louis XIV of France

At birth, the young Louis was reported to have teeth. In 1638, a letter to Oxenstierna, the famous jurist from the Dutch Republic (Netherlands), Hugo Grotius, testifies how ravenous the child was and the pain of the nurses bitten by the small toothed dauphin. The teeth were situated in the maxillary incisor region.

"Everybody was astonished when Anne of Austria, after twenty years of sterility, gave birth to a prince who already had two teeth. Many times the nurse had to be changed, for the ravenous dauphin was sinking his teeth… into their breast. One of the royal officials complained a lot because of the bites of the baby lion. Her name was Perrette, or Pierrette Dufour; after repetitive bites from the toddler, she suffered from hardness in her udder, which forced her to interrupt breastfeeding, for at least a few days. Her Majesty the Queen Mother only had to touch the inconvenienced parts with a relic to make the pain and the hardness disappear; the nurse could then continue to breastfeed her noble infant."

Pierrette continued to breastfeed the dauphin whilst she was needed, that is to say for two years.

In addition, other wet nurses were required. Three months after his birth, he had managed to get through three nurses.

"Those who had not Milk enough," according to the writings of the surgeon Dionis, "he bit their Nipples, even till the Blood came."

From January 1639, he had exhausted nine nurses. In August, Grotius wrote from Paris to van Baerle (1584-1648), a Dutch geographer and theologian:

"The dauphin would not limit himself to dry up his nurses, he would tear them with his bites. It's France's neighbours that have to mistrust such a precocious voracity."

Compte de Mirabeau

Mirabeau's birth was surrounded by a highly questionable legend.

"A turbulent pregnancy and the supernatural dimension of the child's head put the mother in the greatest danger. The size and vigor of the newborn were unprecedented, and two molars were already formed in his mouth."

"He was born with a twisted foot, two big teeth and a huge head above all. He also had his tongue tied by the web. Before presenting the child to his father, the nanny warned him: "Do not be afraid."

And the obstetrician added, "He will have a hard time expressing himself."

Modern incidence

In 2013, Jonathan Wyllie, a consultant neonatologist at James Cook University Hospital in Middlesbrough, England, stated that in this hospital, natal teeth occur once in every 2000 or 3000 births. "Babies were born with one or two teeth, and it usually is in the lower gums."

References

Riaud X. Chroniques odontologiques des rois de France et de la dynastie napoléonienne [Odontological chronicles of the kings of France and of the Napoleon dynasty]. Paris: L'Harmattan, Collection Médecine à travers les siècles [Medicine throughout centuries collection] ; 2011. 289 p.

Jeeves Paul, "Big Gum! Middlesbrough baby born with two front teeth", in https://www.express.co.uk, 2013.

Address for correspondence: *145, route de Vannes, 44800 Saint Herblain, France, 0033240766488, xavier.riaud@wanadoo.fr.*

Author Biography: *DDS, PhD in History of Sciences and Technics, Laureate and Associate member of the National Academy of Dental Surgery, Free member of the National Academy of Surgery.*

Dental Historian 2019 64 (1) 27-31

History of metal inlays in Japan

Tomomi Yamada and Mikako Hayashi

Abstract: This paper gives an outline of the historical background and future perspectives of Japan's metal inlays.

Keywords: metal inlay, gold-silver-palladium alloy, posterior restoration, Minamata Convention on Mercury

History of metal inlays in Japan

Japan stopped using amalgam restorations earlier than other developed countries, and switched instead to composite resin and metal inlay restorations for molar teeth. There were both push and pull factors leading to the use and disuse of amalgams, as we explain in this brief history of restorative treatments in conservative dentistry with special focus on metal inlays.

Introduction of Western operative dental treatments in Japan

Japan's Shogun rulers closed the country's borders for centuries, except for limited trade and other access, principally via Nagasaki. With the coming of US Commodore Matthew Perry's famous "black ships" in 1853 and the Restoration of the Meiji Emperor in 1868, things began to change rapidly as Japan again opened to the world.

Modern dentistry was introduced by American dentists who arrived in Yokohama, mainly to treat their fellow Westerners in the foreign settlement there. The first American dentist was W.C.Westlack, who opened a clinic in October 1865[1]. By 1870, there were at least seven American dentists listed in Yokohama[1]. Among them was W. St George Elliott, a military doctor in the American Civil War who completed his dental studies in Philadelphia. He set up shop in Yokohama in 1870, and reported in 1873 that, "Dentistry [in Japan] exists only as a mechanical trade, and the status of those who practice it is not very high. It is, in fact, graded with the carpenters – their word hadaiku-san meaning tooth-carpenter[2]. Elliott is noteworthy in that he hired an assistant Einosuke Obata, who took the National Medical Licensure Examination to obtain a licence to practice dentistry, and thus became the first modern Japanese dentist in 1875[1].

New regulations were introduced in 1883 to include dental subjects in the medical licence examination, though it was not until 1906 that Japanese dental law was established[1]. The first modern dental school, Takayama Dental School, which became Tokyo Dental College, was established in 1890[3]. By the early 1900s, numbers of Japanese were also going abroad to dental schools in the West, and bringing back Western knowledge and techniques which they assimilated to become leaders of Japanese dentistry.

Metal inlays

In The Daily Japan Herald of November 1, 1866 "American Dentist J.S. Burlingham advertised "all kinds of cavities filled in a superior manner with Gold, Platinum, Silver and other good fillings", as well as "painless extraction" of teeth – "without the knowledge of the patient," he boasted[1]. Records show that Japan began importing gold foil, amalgam and other dental equipment from SS White Co in the US in the 1870s[1].

Metal inlays initially introduced in the USA became widely used in Japan with the lost-wax technique[4]. Gold alloys were considered the preferred material for metal inlays because their softness permitted good marginal sealing and stability. But the high price of gold alloys was a problem. To achieve both superior properties and cost effectiveness, silver-based alloys were developed as alternatives to gold ones in Japan. In 1920's, dental gold and silver-based alloys were available from domestic dental materials companies[5].

In 1922, groups of Japanese companies set up a medical insurance system with optional subscription for their employees, and gold inlays and silver alloy inlays were approved as restorative treatments covered by the insurance[6]. In 1937, 'silver-palladium alloy S' (Shofu Co. Ltd.) became commercially available as a patented alloy[7]. This alloy was composed of 30% palladium and either ≤0.9% zinc or cadmium added to the silver to prevent its sulphidation, while maintaining its flexibility and

ductility. Nagai reported that its physical properties, such as Brinell hardness and expansion coefficient, were the equivalent of 22K[7]. Based on the experience and knowledge of producing the silver-palladium alloy, Shofu Co. Ltd. developed gold-silver-palladium alloys by adding pure gold to 'palladium S', where the concentrations of gold were controlled from 9% to 19% depending on the use for inlays, crowns, bars, and palate plates[7].

In the troubled economic, social and financial times of the 1930s, Japan suffered from a serious outflow of gold[8]. In 1939, silver-palladium alloy was approved as an alternative to gold alloys for metal restorations by the Japanese Government because of a serious shortage of gold[9].

At the end of the World War II, Japan was economically and financially devastated. This was an important factor driving research on developing alternative alloys based on the experience of other countries [10]. In the 1950s, more than 10 types of silver-alloy products for inlays were commercially available with different concentrations of tin or zinc added to the silver[11]. In addition, silver-palladium alloy, gold-silver-palladium alloy including 5% gold, and 14K gold alloy with copper and silver were produced. Other alloys such as copper with 10 to 20% nickel or 15-25% zinc were also developed[10].

The aim of Japanese research was to achieve superior clinical performance of metal inlays using alternative alloys, at least comparable to gold alloy inlays. The work was successful, and the metal inlays using alternative alloys were accepted for treatments under the Japanese National Universal Healthcare Programme[12].

Operative treatments under Japan's national health insurance scheme

Japan's national health insurance system is key and integral to the development of metal inlays. The National Health Insurance Act allocates public expenditure to maintain universal health care, and people are required to pay insurance premiums based on their income. In return, people receive insurance-covered treatments for which 30% they pay or less of the cost[13]. People can freely select the medical facilities where they receive treatments. They are free to select the treatments not covered by the insurance, but in this case, they will have to pay the full price so there is a financial incentive to opt for treatment covered by insurance. Dental treatment has remained firmly inside the Japanese health insurance system. Japan's healthcare costs in 2016 were 41.3 trillion yen (8% of GDP), of which the dental care cost was 7% (2.87 trillion yen)[14]. The national medical care expenditure per capita in Japan is 325,000 yen (2,874 dollars, 1 dollar=114yen), while it is 8,713 dollars in the USA and 3,235 dollars in the UK [14].

When the national insurance scheme began in 1958, operative treatments including amalgam, phosphate cement, silicate cement, and MMA resin, and restorative treatments such as 14K post inlay, 14K inlay, and other alloy inlays were included as insured treatments[13]. Amalgam was used for restoring Class I cavities. Both amalgam and inlay restorations were used for restoring Class I and Class II two-surface cavities, while inlay restoration has been the preferred choice, rather than amalgam, for restoring a MOD cavity. The initial scheme excluded gold foil filling and porcelain inlay restorations.

In the present day (2018), 14K gold alloys, gold-silver-palladium alloys, nickel-chromium alloys, and silver alloys are used for metal inlays under the health scheme[15]. 14K gold alloy is only used as the abutment of an inlay bridge. Silver alloy is generally used for restoring primary teeth. Gold-silver-palladium alloy, which is most popular for inlay restorations, is standardized to contain 12% or more gold by the Japanese Industrial Standards. The examples of composition of each alloy is as follows:

Gold-silver-palladium alloy: 12% gold + 48% silver + 20% palladium+17% copper

14 K gold alloy: 58% gold + 8% silver + 28% copper + 5% zinc

Silver alloy: 70% silver + 25% indium + 4% zinc or iridium + 1% palladium

The cost of metal inlays for patients, allowing two visits for a restoration under the 30% of insured rates is summarized in Table 1. Class II inlays using gold-silver-palladium alloy cost 3,129 and 3,345 yen for a premolar and a molar, respectively[15]. Class II gold inlays and all ceramic inlays are not covered by the health insurance scheme, and run to 50,000

Table 1. Cost of metal Inlays under the 30% of insured rates

Material for Inlay		Class Ⅰ		Class Ⅱ	
		(Yen)	(US $)	(Yen)	(US $)
Premolar	Gold-silver-palladium alloy	2556	21.3	3129	26.1
	Silver alloy	2292	19.1	2607	21.7
	Nickel- chromium alloy	2271	18.9	2553	21.3
Molar	Gold-silver-palladium alloy	2694	22.5	3345	27.9
	Silver alloy	2310	19.3	2631	21.9
	Nickel- chromium alloy	2271	18.9	2553	21.3
Premolar/Molar	14K gold alloy	—	—	4419	36.8

Table 2. Cost of gold and ceramic Inlays which are not covered by the health care insurance

Treatment	Class Ⅰ		Class Ⅱ	
	(Yen)	(US $)	(Yen)	(US $)
Gold Inlay (18K, 20K)	30,000～53,000	250～567	50,000～68,000	417～567
All ceramic Inlay*	30,000～70,000	250～583	50,000～95,000	417～782

Table 3. Teaching of posterior composite restorations in Japan from 1986 to 2017

Year	Number of respondent schools	Percentage of schools including teaching of posterior resin composites (%, n)	Schools teaching various types of posterior composite restoration (%, n)			
			Occlusal premolar	Occlusal molar	2-Surface occluso-proximal premolar	2-Surface occluso-proximal molar
2017	29	100%(29)	100% (29)	100% (29)	100% (29)	100% (29)
2007	23	100%(23)	100% (23)	100% (23)	96% (22)	74% (17)
1997	27	93%(25)	93% (25)	93% (25)	67% (18)	67% (18)
1986	14	64%(9)	No information collected on this question.			

(Hayashi M, Yamada T, Lynch CD, Wilson NHF,. Journal of Dentistry 2018: 76: 19-23.より、一部改変)

to 68,000 yen and 50,000 to 95,000 yen, respectively (Table 2).

Effect of the Minamata Treaty on the Japanese restorations

The then mysterious 'Minamata disease' was reported in Minamata in Japan's Kyushu Region in 1956[16]. Later research in 1963 showed the disease was caused by the release of methylmercury in industrial wastewater from a chemical factory. Minamata disease and worries about pollution generally became a Japanese social issue. These led to worries about amalgam containing mercury. Although the mercury used in amalgams is inorganic mercury, different from the organic mercury that caused Minamata disease, mercury itself or the mercury gas released when removing amalgam restorations pollutes the downstream environment. Minamata was a major factor impelling Japanese researchers to develop composite resin materials as alternative restorative materials to amalgam in the 1970s. Chemically cured and light-cured composite resin restorations were added to the national health insurance scheme in 1974 and 1989[17, 18], respectively. From the 2000s, composite restorations in molars have become extremely popular, not only because of their superior appearance, but also the drastic improvement in dentine bonding and its superior handling supported by nano-filler technology.

As the share of resin composite in posterior restorations increased, and metal inlays were other choices for restoring posterior restorations, major Japanese dental companies stopped selling amalgam from 2006. However, the use of amalgam continued using imported materials, though on a small scale. In 2013, the Japan Dental Association supported the proposal that mercury itself should be abolished globally[19]. Amalgam was removed from the national health coverage from April, 2016[20] before the establishment of 'the Minamata Convention on Mercury, which was activated by United Nations Environmental Programme in August 2017[21].

Teaching of operative dentistry in Japan

Figure 1 Lower premolar and molar previously restored with metallic inlays using gold-silver-palladium alloys, were replaced by resin composites because of the demand for aesthetic restorations by a patient.

Hayashi et al reported on the current trends in the teaching of posterior composites to undergraduate dental students in Japan by comparing the results of surveys conducted over a 30-year priod[22]. In the 2017 survey, 93% (27/29) of the schools reported teaching composite as the preferred choice of materials for the placement of direct restorations in posterior teeth, whereas 65% (15/29) schools did so in the survey of 2007. Two schools reported teaching metal inlays as the preferred approach even in 2017. No school taught amalgam in clinical skills courses or in the care of patients in 2017. In the previous survey from 2007, all 23 responding schools reported teaching of the posterior composites in occlusal cavities. In the 2017 survey, all 29 responding schools reported teaching the placement of composites in both occlusal and occluso-proximal cavities in premolars and molars (Table 3).

Future perspectives

The Clinical Guideline for treating dental caries by The Japanese Society of Conservative Dentistry recommends composite resin rather than metal inlay when restoring both occlusal surfaces (Class I cavity) and proximal surfaces (Class II cavity) in molars[23]. This is because there is no significant difference in clinical performance of the restorations. However, in the case of composite resin restorations, healthy teeth are preserved as much as possible based on the Minimal Intervention policy; aesthetic appearance is better; and treatment generally takes a single visit. For these reason, direct composite resin restorations of occlusal and proximal surfaces in molars are becoming the preferred option of Japanese clinicians, as long as reliable bonding and composite resin filling are possible.

Gold and metal inlays still have supporters who cite their durability and effectiveness to recover morphological forms of restoring teeth with the help of dental technicians. However, the rising cost of materials because of fluctuations and increases in the price of gold and palladium work against gold and metal inlays. In addition, patients prefer the better aesthetic treatment, along with the greater comfort of MI treatment (Figure 1). These factors make it likely that operative restorations using gold and metal inlays will continue to decrease, shifting towards direct composite resins for restoring Class I and II including MOD cavities.

References

1. Ohno T, Hasaka Y, The dawn of modern dentistry in Japan: The transfer of knowledge and skills from foreign dentists to Japanese counterparts in the Yokohama Foreign Settlement. Japanese Dental Science Review 2013: 49: 5-13.

2. Dental Art among the Japanese. The Popular Science Monthly, 1873: 3: 250-51.

3. Tokyo Dental College, History of Tokyo Dental College http://www.tdc.ac.jp/college/english/history/tabid/222/Default.aspx (12th November 2018 accessed)

4. Hollenback GM, Precision gold inlays made by a simple technic, Journal of American Dental Association, 1943: 30: 99-109.

5. Shofu Company History and the Products, Shofu, Kyoto, 1969, pp17-18. (in Japanese)

6. Nagasaki Dental Association, Dental treatment fee in health Insurance. (in Japanese)

www.nda.or.jp/study/history/nedann (15th November 2018 accessed)

7. Nagai K, Shofu silver palladium alloy, Bunshodou Tokyo, 1941: 13: 1-6. (in Japanese)

8. Policy Research Institute, Ministry of Finance Japan, Chapter 10. Finance (in The financial history in the Showa

period, Oshima K Ed.), Toyo Keizai, Tokyo, 1983, pp155-313. (in Japanese)

9. Nagasaki Dental Association, Dental History Museum. (in Japanese)

http://www.nda.or.jp/study/history#shouwa (15th November 2018 accessed)

10. Hanazawa K, Alternative to gold alloys for metal restorations. Shika gakuhou, 1939: 44: 33-47. (in Japanese)

11. Fusayama T, Alternative alloys for inlay (in Metal Inlay). Ishiyaku Publishers, Tokyo 1952, p389-408. (in Japanese)

12. Fillings and inlays (in The interpretation of the dental treatment fee). Syakaihoken-Kenkyusyo, Tokyo. 1958, pp96-97. (in Japanese)

13. Ministry of Health, Labour and Welfare, Japan, Overview of medical service regime in Japan. (in Annual Health, Labour and Welfare Report 2016.

https://www.mhlw.go.jp/english/wp/wp-hw10/dl/02e.pdf (15th November 2018 accessed)

14. Ministry of Health, Labour and Welfare, Japan, Estimates of national medical care expenditure, FY 2016. 2018.

https://www.mhlw.go.jp/english/database/db-hss/enmce_2016.html (12th November 2018 accessed)

15. Inlay (in The interpretation of the dental treatment fee), Syakaihoken-Kenkyusyo, Tokyo 2018, pp424-427. (in Japanese)

16. National Institute for Minamata Disease, Ministry of the Environment, Japan, Minamata Disease Archives. http://nimd.env.go.jp/archives/english/index.html (14th November 2018 accessed)

17. Filling (in The interpretation of the dental treatment fee), Syakaihoken-Kenkyusyo, Tokyo, 1974: pp162-165. (in Japanese)

18. Filling (in The interpretation of the dental treatment fee) Syakaihoken-Kenkyusyo, Tokyo, 1989, pp267-270. (in Japanese)

Japan Dental Association, Statement on Dental Amalgam. September 2013. (in Japanese) www.meti.go.jp/committee/sankoushin/seizou/kagaku/seido_wg/pdf/002_s01_00.pdf (15th November 2018 accessed)

19. United Nations Environment Programme, Minamata Convention on Mercury. www.mercuryconvention.org/Portals/11/documents/conventionText/Minamata%20Convention%20on%20Mercury_e.pdf (15th November 2018 accessed)

20. Ministry of Health, Labour and Welfare, Japan, Summary of the revision of the dental treatment fee. 2016.in Japanese

https://www.mhlw.go.jp/file/06-Seisakujouhou-12400000-Hokenkyoku/0000115718.pdf (15th November 2018 accessed)

21. Hayashi M, Yamada T, Lynch CD, Wilson NHF, Teaching of posterior composites in dental schools in Japan – 30 years and beyond. Journal of Dentistry 2018: 76: 19-23.

22. Japanese Society of Conservative Dentistry, Usefulness of direct resin composite for posterior teeth. (in The clinical Guideline for treating dental caries. 2nd ed) Nagasue Syoten, Kyoyo, 2015, pp139-152. (in Japanese)

Authors Biography:

Dr Tomomi Yamada, qualified as a dentist from Osaka University in 1990. Assistant Professor of Restorative Dentistry and Endodontology, Osaka University Graduate School of Dentistry, Japan since 2008.

Dr Mikako Hayashi, qualified as a dentist from Osaka University in 1987. Professor of Restorative Dentistry and Endodontology, Osaka University Graduate School of Dentistry, Japan since 2012.

Address for correspondence: *Dr Mikako Hayashi, Department of Restorative Dentistry and Endodontology ,Osaka University Graduate School of Dentistry, 1-8 Yamada-oka, Suita, Osaka 565-0871, Japan, TEL/FAX: +81 6 6879 2926,*

E-mail: mikarin@dent.osaka-u.ac.jp

F

The Veterinary Surgeon and Dentist-an interesting Stamp and Envelope

Stuart Geddes

Key words: Philately, advert, veterinary surgeon, dentist

Introduction

As an avid collector of stamps I am sometimes made aware of a cover relating to dentistry. The envelope shown in (Fig 1) stamped with the date 31st January 1894, is of special interest as it has an advert for a veterinary surgeon and dentist.

The advertiser

Harry Fulstow was the son of immigrants from England who arrived in America in 1881 and settled in Ohio. John, his father became a prosperous farmer and Harry went to the veterinary college in Toronto. When he qualified there he returned to Ohio in 1892 to establish a veterinary practice in Norwalk.

The advert

The advertising envelope, used two years after the practice was established shows a rather fine horse which perhaps indicates Harry's main veterinary interest. But, was he just treating animals? He could have been a 'horse dentist' but horses' teeth were usually left to the blacksmith. Or, did he treat human dental problems too!

Author Biography: *Formerly a general practitioner and the BDA Director in Wales I now concentrate on my garden and my postal history collection of which 'dentistry' forms a small 'fun' section.*

Corresponding Author:
Stuart_geddes@hotmail.com

Figure 1