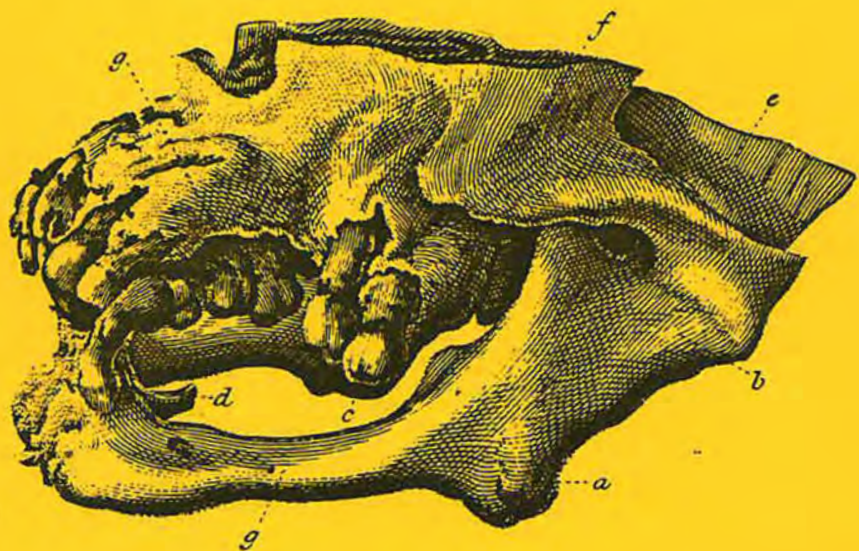


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THE BIRTH OF THE SPECIALTY OF ORTHODONTICS

PART I

J T Cook

Very early records of anything are naturally scarce, but there is ample evidence that irregularities in the teeth are as old as mankind. Skulls that date back 50,000 years or more show retained deciduous teeth, impacted permanent teeth and supernumerary teeth, and clearly there must have been many dental malocclusions.

Relics of early civilizations show that appliances were fitted to the teeth. Admittedly these were prosthetic and not orthodontic appliances, but the materials and techniques that were used - banding teeth with precious metals and ligating teeth together with precious metal wires - set the pattern for the design of early orthodontic appliances.

The first recorded reference to dental irregularity dates back to the 4th century B.C. when Hippocrates, in the sixth book of Epidemics, referred to

"individuals whose heads are long shaped - having strongly arched palates; teeth are disposed irregularly, crowding one on the other and they are molested by headaches and otorrhoea."

This is an interesting observation on the effects of facial morphology on the dentition.

The first reference to deliberate tooth movement is the well known and often quoted observation by Celsus (25 B.C. - 50 A.D.) that:

"the root of the temporary tooth produces in children a new tooth which usually pushes out the first - sometimes, however, the new tooth appears above or below it."²

His advice was to draw out the retained tooth and guide the misplaced permanent tooth by daily finger pressure. This advice recurs at intervals over the next 2,000 years. It is unlikely that it originated with Celsus and may have been used for centuries before this.

Pliny (23-79 A.D.) did not practice medicine but in his book Natural History he advocates filing elongated teeth to align them. Galen must have been the first man to review the current orthodontic literature, and he advocated both finger pressure to align irregular teeth and filing down of elongated teeth.

From here till the 16th century there is virtually nothing of note recorded except for a valuable contribution by Abulcasis, Abul-Casem-Chalef-ben-Abbas, an Arabian physician and surgeon who lived about the year 1,000. His contribution was the invention of a series of 15 dental scrapers which he used to remove calculus. He also devised dental files and dental saws. He observed

"when a tooth is irregularly placed or projects above the level of the others a deformity ensues which is particularly displeasing in women. The way of correcting this varies according to the case - sometimes simple extractions of the misplaced tooth, but when there exists an intimate union of the irregular tooth with another one it is necessary to operate for the resection of the former with an instrument the shape of a small axe. The instrument

must be made entirely of indian iron and the operation is to be carried out in several days, that the fall of the tooth may not be provoked by excessive shaking."³

His small axe was about 4" long and is not as alarming as the description might suggest.

In 1530 a small book entitled Artzney Buchlein was published in Leipzig. There were 15 editions in less than 50 years and in 1532 the edition known as Zene Artzney contained a chapter "How to assist children that their teeth grow easily." This suggested that deciduous teeth that which are impeding permanent teeth should be extracted and that the irregular permanent teeth should be moved into line by means of daily finger pressure.

The orthodontic scene, and indeed dentistry as a whole, was most active at this period in France. Students of dentistry were admitted to the French universities as early as 1580 but a subdivision of the Surgeons Guild - The Surgeon Dentists - was not created until 1699. A decree in 1700 limited the activities of the barber surgeons to simple operations, and those who wanted to practise dentistry after that date had to pass an examination.

Pierre Fauchard was the first writer to describe himself as surgeon dentist and his book, in 1728, included a chapter on twisted, irregular and loose teeth and their treatment.⁴ The book records 12 case histories, including one in which irregular permanent teeth were moved into line by regular finger pressure. He points out that the teeth of young people straighten relatively easily but that treatment in adults takes longer: to

shorten the treatment time he resorted to the use of the pelican. Two such cases are described; one a 22 year old man and the other a 12 year old girl. After first making space with a file he applied the pelican and moved the teeth into line forcibly. The corrected tooth was tied to the adjacent teeth for 8 days with common thread and the patient was advised to use an astringent mouthwash.

Fauchard advised that milk teeth should be removed only in cases of absolute necessity and if they were causing intolerable pain, because the underlying tooth germ may be damaged and sometimes, as he pointed out, deciduous teeth are neither shed nor replaced. He concluded with the dreadful warning that ignorant tooth drawers have been known to remove a crooked permanent tooth and to leave the straight deciduous one.

Fauchard's main contribution to orthodontics, however, was his description of the first orthodontic appliance. This has been variously described as the bandeau bandelette or simply as the band. It consisted of a strip of precious metal, silver or gold, the width less than the height of the tooth and it should be neither too stiff nor too flexible. The band was bent into the shape of a regular arch and was perforated at the appropriate points to allow threads to be passed through the plate and round the irregular teeth and those adjacent to them. By repeatedly tightening the threads the irregular teeth were drawn into line in the arch.

Fauchard acknowledges that the appliance he described was not his invention but it is the first recorded tooth straightening appliance and has been regarded as a forerunner of all dental expansion arches. Lillian Lindsay, in the second Northcroft Lecture,⁵ pointed out that this was not intended to be an expansion arch and that the idea of expansion never occurred to Fauchard. This was probably true, but Edward Angle, who gave the name expansion arch to his patented appliance, states in his text book Malocclusion of the teeth that Fauchard's appliance was the direct forerunner of his expansion arch.

Bourdet, in 1757, described a modification, but the only significant difference is the contouring in the molar region; Fauchard's arch was a plain strip of metal. Bourdet recommended that gold should be used, not silver, because silver blackened in the mouth. He also advised the extraction of first premolars to permit canine alignment. He recommended that premolars be extracted symmetrically to avoid unbalancing the arch. For mandibular protrusion he recommended extraction of the first permanent molars at the age of 7 - a technique that he ascribed to Capuron.⁶

Bourdet was dentist to the king, and a contemporary of his, Phillipp Pfaff, was dentist to Frederick the Great of Prussia and he invented the use of plaster models poured into wax impressions.

John Hunter published his Natural History of the Human Teeth in 1771.⁷ This book is a classic of anatomy but the references to treatment have been criticised. Fox, in 1814, had this to say:

" Mr. Hunter's publication on the teeth was the first scientific book ever published on the subject and as an anatomical work must ever enjoy great celebrity - but not having devoted much of his attention to the operations on the teeth there can be no reflection on Mr. Hunter's merit in stating that in many essential points he was solely but unavoidably deficient."

It is thought that Hunter depended for his knowledge of treatment on the work of Pare, who lived 200 years earlier. He did, however, describe the use of the silver arch and ligatures to draw teeth into line and also described a lower silver plate which incorporated an inclined plane for the treatment of mandibular protrusion. Clearly Hunter recognised that, in addition to correcting irregularity of the teeth, the relationship of the upper dentition to the lower was of some importance.

Fox, in 1803, wrote the first English textbook to give explicit instructions on the correction of dental irregularities.⁸ The methods that he described in The Natural History of the Teeth were practised until well on in the 19th century. He used an arch similar to that of Fauchard and Bourdet, but he pointed out that, in addition to moving the irregular teeth, it was necessary to prevent the action of the opposing teeth. To achieve this he added ivory blocks between the occlusal surfaces of the molars to gag open the bite and to free obstruction by teeth in the opposing jaw. Fox also produced the first recorded classification of irregularities of the teeth.

Although Hunter was aware of the importance of the dental arch relationship, Duval, in 1820, was the first to point out the concept of occlusion.

"It is not sufficient that teeth are properly arranged by the side of each other, those of the upper jaw have special connection with those of the lower."

Catalan illustrated an inclined plane.¹⁰ This had been widely used previously and had been described by John Hunter but Catalan's name was for many years associated with the inclined plane.

Delabarre described the use of metallic caps for rotations of teeth.¹¹ Previously, notched hickory wood tied with silk ligatures had been used for rotation although of course Fauchard used immediate torsion. Delabarre was probably the first to use a lever or whip arm to rotate a tooth. He also produced another classification of malocclusion and used the terms overbite, underbite, edge to edge and crossbite for the first time.

In 1825 Joseph Sigmond described crossbite initiated by contact on the deciduous canine causing mandibular displacement, or a bite of accommodation. "No time is to be lost, but with a proper file the superfluous part of the teeth should be gradually reduced."¹² As the upper incisors tend to erupt inwards, he recommended that the child be given a piece of flat wood to act as a lever to force the incisors into their proper situation.

Kniesel used a chin cap with occipital anchorage and also developed the impression tray and took impressions with a wax composition.¹³ During the entire time of the treatment the

patient was kept quiet and was instructed to partake of food that was easily digestible - preferably in liquid form. In order that all food and drink may be indulged in, he also permitted removal of the appliance from the mouth. His treatment time was six days for patients aged 8/9 years, increasing to 6-8 months for patients 13-14 years old.

The first exercise in patient education was made in 1841 when Solyman Brown wrote an essay on regulating teeth at the direction of the American Society of Dental Surgeons. It was intended that this booklet should be given to parents. One heart-rending paragraph reads

"Can mothers then be so indifferent to the happiness of their children as to give this subject but a passing thought? Will fathers who spend their lives in an effort to amass fortunes for their offspring do absolutely nothing, to give value to the patrimony which they bestow?"¹⁴

In 1841 Schange developed the crib, which gave very improved retention and hence increased the efficiency of appliances.¹⁵ He produced tooth movement by means of screws and also by using elastics, at the suggestion of Lachaise. He also drew attention to the need not only to move teeth into line but, having achieved a satisfactory position, to retain the teeth to prevent them from moving back again.

Schange used occipital anchorage, but Gunnell claimed to be the first to have used this. Hayden had suggested to Gunnell that he should use straps for this purpose but they proved unsatisfactory, and Gunnell modified Fox's chin cap, placing ivory blocks between the teeth and progressively tightening the straps of the chin cap. The patient also used a wooden lever

between the incisors, to tilt the upper incisors forward and the lower incisors backwards.¹⁶

Carabelli produced a classification of malocclusion using the term normal, edge to edge, open bite, protruding (2/1), retarding and crossbite.¹⁷

In 1843 Desirabode pointed out that tooth position could be affected by muscle pressure from lips and tongue.¹⁸

Linderer, in the 1840s, discussed the timing of extraction of deciduous teeth. He advised their retention for as long as possible but indicated that there were occasions when extraction of the deciduous teeth at the appropriate time followed by extraction of permanent teeth could prevent irregularity from developing.¹⁹ This was the first suggestion of serial extraction.

Sir John Tomes, in 1848, described plates made of ivory with pieces of dry compressed wood interposed between the ivory and the teeth.

"On absorbing moisture the wood swells. As the fitted ivory cannot be moved backwards the teeth are necessarily moved forwards. After the wood has remained about 8 and 40 hours it should be removed and a piece of fresh wood put in its place."²⁰

He also illustrated a vulcanite plate with a gold labial bow that was adjusted by tightening a nut. Tomes made reference to the use of a piece of wood shaped like a handle of a spoon which was used to lever instanding upper incisors forwards. He too drew attention to the importance of lip, cheek and tongue pressure in forming the dental arches.

Simon Hüllihen was probably the first to advocate surgical correction of extreme mandibular protrusion and describe how the operation was carried out.

"To remove the projection of the underjaw seemed to require the first attention. This lengthening of the jaw had taken place entirely between the cuspid and first bicuspid tooth on the right side and between the first and second bicuspids of the left. By this elongation, the teeth just described were separated on both sides about 3". To saw out the upper edge of these elongated portions of the jaw and then to divide that part of the jaw in front of the spaces thus made by sawing it through in a horizontal manner so as to permit the upper and detached portion to be set back in its proper and original position, appeared to be the only possible way of remedying the deformity. This plan I therefore adopted and performed the operation on 12th June 1848."

Dwinelle is thought to have introduced the jack-screw in approximately 1849. He first made it of gold but later used steel because of its greater strength. He discovered that oxidation was prevented by placing a small amount of zinc in a hole in the end of the screw.²² Strangely, the jack-screw was also introduced at about the same time by Gaine.²³ It seems that these discoveries were made independently and both men are credited with its introduction. There was some argument a few years later about who could claim to be the first to have used the screw, but it would seem from the records that Dwinelle anticipated Gaine by about two years.

Thomas Wiltberger Evans in 1854 laid out four principles to be considered in making any appliance for the regulation of the teeth.²⁴ He said that it should have a firm support which shall not loosen or injure in any way the teeth to which it is attached; there should be steady and sufficient pressure which

can be graduated to suit particular cases and particular stages of an operation; it should have great delicacy of construction that the apparatus may be as light as possible so as neither to injure or annoy the patient; it should have the mechanism as simple as the case will admit of, in order to economise on both labour and time.

Bremner²⁵ suggests that these views may have resulted from Evans having practised in Paris for many years, where his clientele doubtless included the spoiled children of the French aristocracy, and that appliances had to be delicate to cause the least annoyance to his fussy patients. Nevertheless, diagrams of Evans' appliances show, for the first time, appliances that look both efficient and tolerable. He used tubes soldered to bands; a threaded labial arch; clamps or cribs to open the bite, and he also showed a gold plate with hickory pegs to move the teeth. These may not have been original; many papers in early dental periodicals were without illustrations and relied on descriptions of the appliances.

In 1856 Gaine produced a 35 page treatise on irregularities.²³ This showed that little progress had been made since Fox's publication in 1803, and Gaine candidly acknowledged that any success in his work derived from his understanding and successful application of Fox's principles.

In 1860 Emmerson Angell, in the San Francisco Medical Press, described maxillary arch expansion to provide space for crowded teeth.²⁶ This expansion was achieved in about two weeks and is

regarded as the first record of widening the median palatal suture.

It would appear that an expansion screw was used to produce the tooth movement. The suggestion that the median suture had been opened was doubted by a reviewer of Angell's paper, and also by the editor of the Dental Cosmos in which the paper also was published.²⁷ The editor went on to say that if it had really occurred this would be a strong argument against the use of the appliance because the irregularity of the teeth was trifling compared with the separation of the maxilla, which could not take place without inducing serious disturbance in the surrounding hard and soft parts.

(To be continued)

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PATHOLOGY OF THE TEMPORO-MANDIBULAR JOINT AND ITS
TREATMENT IN THE FIRST HALF OF THE 19TH CENTURY

PART I

Curt Gerhard Lorber

Paper presented to the FDI Working Group on the
History of Dentistry, Amsterdam, 1989.

Introduction

I have already illustrated the development of knowledge about the temporo-mandibular joint (TMJ) up to the end of the 18th century, at the 13th International Congress of the History of Medicine in Dusseldorf, in the summer of 1986. A similar review was earlier delivered to the Medical Society of Genoa (6 Aug 1801) by Tomaso Bertamino, Professor of anatomy and surgery, which permitted a retrospective glimpse of such knowledge at the beginning of the 19th century. He cited the investigations of Albinus, Berten, Ferrein, Monro primus, Ruisch, Weitbrecht and Ludolf's dissertation of 1749.

Bertamino considered that Jean Louis Petit had misunderstood the mechanism of dislocation of the TMJ, in his assumption that the condyles move forward to position themselves on a line passing from the origins of the muscles to their insertion; if they moved further forward, they would surpass this [& dislocate]. Monro primus believed that it would be impossible to close the mouth after dislocation of the jaw, since the coronoid process would have slid beneath the inner root of the zygomatic process and in front of the articular eminence, and be pressed against this bone. Bertamino herself, having precise knowledge of anatomy and

the principles of mechanics, opined that it would be possible to determine the central directions of the mass of muscles, and to explain the mechanism of dislocation in this way. But he gave no new point of view. On the contrary, he simply based his theories on long-established knowledge, with the addition of iatromathematics and iatrophysics (only recently developed), in order to give the impression of something new.

Ankylosis and dislocation

In 1805, Johann Gottlieb Walter described the collection of the Anatomical Museum in Berlin, which contained a specimen of an ankylosed jaw of a 50-year old man, in which the alveoli of the upper and lower jaws were fused together by a mass of bone, although the lower jaw had not united with the temporal bone at the condylar process. A further specimen of a 20-year old man demonstrated ankylosis between the lower jaw and the zygomatic bone. Mothe (1812), a surgeon from Lyon, recalled the concept of luxation [dislocation] muscles, originating from Claude Pouteau, and tried to apply it to the masticatory muscles, implying that the lower jaw could dislocate itself. Here the first suggestion of habitual dislocation of the lower jaw seems to appear in outline. An ankylosis of the TMJ in a 6-year old girl, at the General Hospital in Vienna in 1813 was believed to be incurable. The London Surgeon John Howship reported a similar case in 1816, and in 1825 J. Snell, a member of the Royal College of Surgeons in London, improved the nutrition of [such] a patient by removing the front teeth.

Sir Astley Paston Cooper (1828) not only gave an account of the unilateral and bilateral luxation of the TMJ and its treatment, with detailed case descriptions, but also mentioned subluxation.

This concept, however, can already be found in the encyclopaedic literature, e.g. the Dictionnaire Encyclopédique des Sciences Médicales (1812-1822). Later, according to the Dictionnaire de Médecine, there is a communication by Carl Christian Schmidt about a tumour albus, i.e. a tuberculous arthritis of the TMJ. It had been known from autopsies that the cartilage of these joints might be vulnerable [to TB], resulting in possible ankylosis.

Early soft tissue surgery

The first attempts to deal surgically with the immobility of the lower jaw were reported in 1829 by Valentine Mott, a famous surgeon in New York and pupil of Cooper. Difficulty in opening the mouth had resulted from strong fusion in the region of the left canine extending to the coronoid process. This had appeared after extraction of a tooth together with a fragment of the jaw. Mott cut open the left cheek nearly up to the coronoid process and removed the adhesions in both jaws by excision of the scar. Using instrumentation, he fractured the bony union, and closed the cheek with three sutures and adhesive plaster. The instrument or a piece of wood covering it was left in place, the mouth held open, and pieces of sponge placed between the lower jaw and the inside of the cheek. After he had similarly and successfully treated a man from Louisiana, a 17-year old lady, whose teeth and gum had been denuded after a gangrene of the left cheek, came

into his care in 1831. He decided to excise the scar and to replace it with sound tissue from the face and neck, achieving a satisfactory result. In the same year W. Jesse Mighels from Minot, Maine, reported a similar case in which he slightly modified Mott's method by not excising the scar.

J. Cruveilhier reported an ankylosis of the lower jaw with the temple in a woman from Aubusson, who, despite this, had reached the age of 89; he also cited Palfin who had described a similar change. A further example of this was to be found in the rooms of the Faculty i.e. the skeleton of Captain Simon, whose history had been recorded by Percy. As a result of bivouacking on damp ground, he [Simon] had developed not only an ankylosis of both TMJs but similar changes in the joints of the lower extremities. There had already been speculation about the processes of bony fusion, and A. A. Sebastian, professor in ordinary, cited Lobstein's investigation of 1833 and his supposition that true or complete ankylosis would arise from spurious ankylosis by enrichment with calcium phosphate of the cellular-connective pseudo-membranes between the opposite surfaces of the joints. At first, the cartilage of the joints might be destroyed by inflammation and suppuration, as shown by Schumer. Occasionally ankylosis could develop in joints without preceding inflammation, near fractures, after unduly prolonged immobilisation. However, if mobility could be maintained, ankylosis could frequently be prevented. He then described the fusion of the mandible, maxilla and zygoma on the left side of a skull taken from a cemetery, but now in Camper's anatomical collection.

In 1839 Doctors Testelin and Charles Danbressi from Lille reported a case of ankylosis in a brush-maker, similar to the above mentioned Captain Simon. In 1833, the celebrated German surgeon Louis Stromeyer, from Hanover, reported the repositioning of a bilaterally-luxated lower jaw of 35 days' duration, using steel forceps he had specially developed for this purpose. Unlike Junk who only used manual repositioning, Stromeyer forcibly extended the mandible with these forceps and his assistant reset it with his thumbs covered in linen, while Stromeyer himself facilitated its backward movement by pressure on the condyles. In his handbook on surgery (1844), he laid particular stress on the fact that luxation could only occur in a forward direction, with the condyle passing the edge of the disc; he supposed that on opening the mouth wide, the condyle would move forward, but at this point a sudden cramp in the anterior part of the masseter and external pterygoid [muscles] would draw the condyle over the articular eminence. Clearly Stromeyer's concept of the mechanism of luxation of the TMJ was greatly influenced by Cooper.

In 1839, Dieulafoy published a paper on the separation of the masseter and pterygoid muscles, mainly intra-orally, in a soldier in France's African Army, whose jaw had become immobile following scurvy. By this operation such immobility could be cured completely. In the same year Mutter, Professor of Surgery at the Jefferson Medical College in Philadelphia, separated a band of strong fibrotic scar tissue in the anterior part of the masseter muscle, intra-orally, before introducing a Rorer lever.

Treatment of immobility of the lower jaw by separating the muscles subcutaneously was then studied systematically, on both cadavers and living persons, by Bonnet, chief surgeon at the Hotel-Dieu in Lyon. Among the diseases of the TMJ itself, other than ankylosis, he mentioned the white swelling accompanied by absorption of the articular cartilage observed by Kulmholtz. Berard too had observed an ankylosis of the lower jaw and the temple. Furthermore, Samuel Cooper, Larrey of Toulouse, Percy and Olivier are said to have noted such cases. Bonnet considered Berard's proposal to cut off the condyles of the mandible to be impracticable. Moreover he had never seen continuous contraction of the elevator muscles due to neurological causes; in such cases he recommended massage and shower-baths to gain flexibility of the muscles. Attempts could then be made to separate the teeth with, for example, prepared sponges which could be introduced between the teeth, or with the elastic springs recommended by Millet. Bonnet did not recommend the division of the internal pterygoid muscles; subcutaneous division of the temporals, and occasionally the masseters, beneath the zygomatic arches, would be sufficient. Finally he described a case in which he undertook such muscle division, but without complete success, and pointed out a similar failure by George Bush in New York.

Higgins, from West River in Maryland, published a contradictory report in 1840 concerning the successful treatment of an immobile lower jaw in a 12-year old negro boy, in which he had separated a cartilage-like adhesion between cheek, gums and jaws with the help of Dr Mott's lever, whose method he followed thereafter as circumstances permitted. Higgins attached little importance to

the division of occasional intra-oral scars, contrary to the recommendation by Mighels. In 1841 Payan, chief surgeon at the Hotel-Dieu at Aix reported an ankylosis of both TMJs in a 75-year old farmer, who, at the age of 5, had fallen from a table. In the same year Jules Guerin, who was mainly concerned with orthopaedic problems as well as congenital dislocations, reported the complete dislocation of the lower jaw into the areas between the zygomata and temporal fossae in a deranencephalic foetus, in which the tension and shortening of the depressor muscles contrasted with the elongation and thinning of the temporals and masseters.

In 1842 William Fergusson reported the division of the buccinator muscle, approximately 0.5" from the anterior border, in a 35-year old man unable to open his mouth after an abscess in the inferior part of the masseter. After complete division of this muscle, opening ability improved. In the same year Heyaly described TMJ ankylosis after a fracture caused by a blow, but the sufferer had remarkably few complaints since he was able to undertake a voyage. Donovan reported repositioning after bilateral dislocation of 98 days' duration (1842). With the help of a stopper as a hypomochlion [fulcrum of a lever] positioned between the last molars, and by raising the chin he reduced the dislocation with the patient lying on the ground, firstly on the left and then on the right. Until then, repositioning after 30 days (Asti) or 35 Stromeyer had been the maximum, the latter using special instruments but the former manual technique only.

Similarly in 1842, Robert William Smith reported congenital dislocation in a 38-year old patient who had been an idiot since childhood. The left half of his face was longer than the right and generally better developed. Smith described this case in great detail, emphasising that a similar malformation had never before been observed, and thought that this TM joint resembled that of rodents. W. J. Little (1843) referred to ankylosis, but emphasised conservative treatment only, using mechanical means such as wooden wedges or screws, or at most the extraction of anterior teeth or the division of contracted muscle fibres. Franz Schuh, Professor of the Second Surgical University Hospital of Vienna, reported a 9-year history of rigidity in a 15-year old student (1844), which he treated by dividing the masseter. In the summer of 1841 he cut through the right masseter close to its lower attachment to the mandible; subsequent division of the exterior muscle layer close to their zygomatic arch attachment improved opening considerably.

Robert, surgeon at the Beaujon Hospital, reported to the Surgical Society of Paris (1845) on the luxations and fracture of the head of the left TMJ in a 30-year old carter, who had fallen asleep sitting on the shafts of his barrow and fallen to the pavement, damaging the left side of his head. The right wheel had then run over his right mandible postero-anteriorly. On palpating the left temple, Robert felt the TMJ condyle above the zygoma, with the outer end outlined below the skin. By pressing his thumb against the inner surface of the ascending ramus and moving it outwards, he finally succeeded in drawing the condyle downwards,

bringing it back into the glenoid cavity. A chin-strap was then applied.

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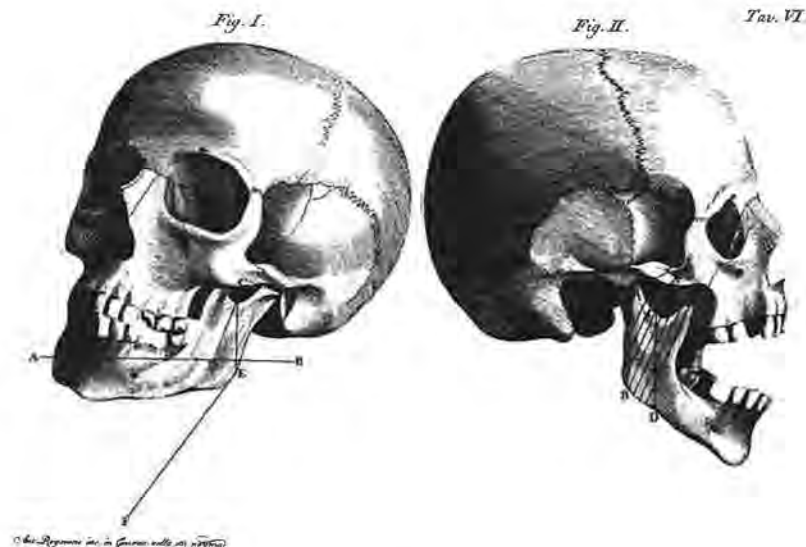


Fig 1

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Fig 2

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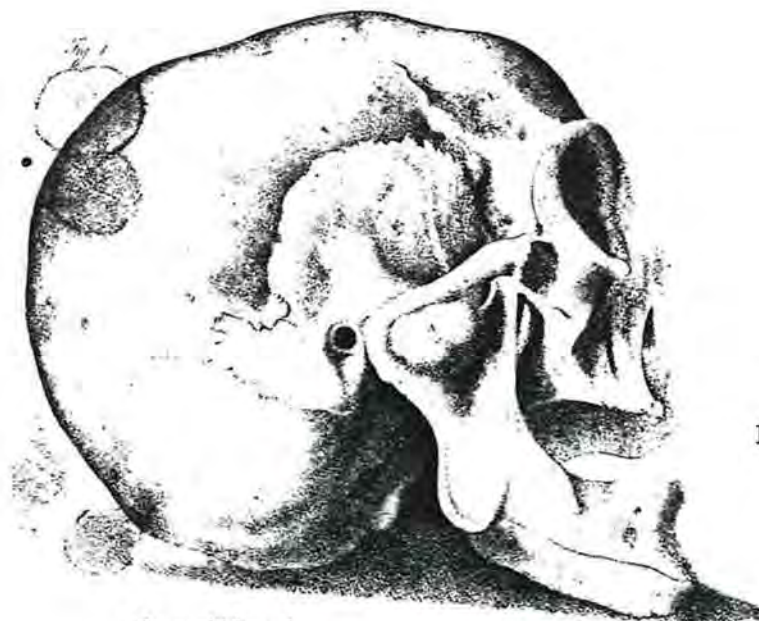


Fig 3

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Fig 4

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Dental Historian cover illustration

Plate 1. Figure 2 from J Howship's Practical observations in surgery, and morbid anatomy (Longman, 1816) represents "the appearance of the ankylosis of the maxillary bones, on a reduced scale". The illustration was provided by Dr Lorber, to accompany his paper on the pathology of the temporomandibular joint.

The Legend is as follows:

- a. The angle of the lower jaw, from which the exfoliated scale of the bone was thrown off during childhood. The part is seen still impressed with the puckered appearance of a cicatrix, confirming the accuracy of the early part of the history of the case. The corresponding part of the opposite side of the jaw exhibits a similar character.
- b. The ankylosed condyle of the jaw, round which the faintly depressed line marks the precise point of union. The striking features of the preparation are extremely singular. The articulating surface of the opposite condyle had lost its natural figure, but was not ankylosed.
- c. The last molar tooth, the fangs of which, as well as those of the tooth next to it, had by time and disuse become consolidated, forming an ossific tumor, larger than the crown of the tooth. The same change, in a greater or less degree, had also taken place in most of the other teeth.
- d. A process of bone projecting backward from the inside of the chin.
- e. Part of the temporal bone.
- f. The os malae.
- g. Exhibit a curious effect of the gentle but frequently repeated pressure, incident to the constant habit of pushing the food at one part of the mouth. It had produced an extensive absorption of the maxillary bone, above and below.

QUEEN VICTORIA AND THE DENTISTS

J.E. McAuley

During Queen Victoria's reign several dental men appear to have held the royal appointment of surgeon dentist to the Crown, but as far as this writer has been able to discover there were few occasions recorded when the Queen herself actually received treatment from any one of them.

Among those credited with holding a royal appointment are Charles J.J. Dumergue, Edwin Saunders and Edwin Thomas Truman. The last named is usually given as dentist to the royal household. It appears that at different times some other member of the Dumergue family may have acted as a deputy. This was definitely so in the case of Edwin Truman when his son Charles acted on his behalf.¹

Edwin Saunders (1814-1901) is a well known figure in British dentistry.² As a young man he was articled to a Mr Lemaile, a dental surgeon in Southwark, and became so expert in dental mechanics that he soon started to give lectures on the subject. He qualified MRCS in 1839, and was appointed dental surgeon to St. Thomas's Hospital. Saunders was appointed surgeon dentist to the Queen and the Prince Consort in December 1847 at £70.00 per annum. He retired from the post in 1883. The Queen must have consulted him and probably received treatment at some time, but no definite record of these occasions has been traced by this writer.

There is no doubt that the Queen considered the teeth of great importance to health, and she was frequently offering advice on the subject to various members of her family. From comments in her letters to them she obviously thought very highly of Edwin Saunders. Prince Albert suffered considerably from mouth troubles especially during the last year or two of his life. In letters to her eldest daughter Vicky, later Crown Princess of Prussia, the Queen on several occasions referred to his dental problems, and on 22 December 1860 she writes:-

"Good Sir James (Clark) as well as Saunders have taken his poor teeth in hand, they require much care."

Again on 21st November 1861 she writes after a long account of the Prince's gumboil and pain:

"It has been a most trying, wearing and distressing time for I could not bear to see him suffer so much and to be so despondent and weak and miserable. I would so willingly have borne it all for him. We women are born to suffer and bear it so much more easily, our nerves don't seem so racked, tortured as men are. Saunders says it is the severest, most obstinate attack he has ever seen."

The pain must indeed have been severe as the Prince mentions it himself in his own diary on 17th February:-

"My sufferings are frightful and the swelling will not come to a proper head."

Apparently the abscess was on an upper molar and incision of the gum had given no relief.

In a letter some days later to Baron Stockmar, physician, and his personal mentor for many years the Prince writes:

"This has been going on for nine days, and a second operation which Mr Saunders has just performed does not give me any assurance that he has reached the seat of the mischief."

In 1858, when her daughter Vicky was in the early stages of pregnancy, Queen Victoria was as usual ready with advice when the Crown Princess probably had some gingivitis. She writes on 30th June:

"I also send you some soothing tincture (which Mr Saunders prescribed) which will do great good: put a teaspoonful of it into water, and hold it in your mouth when you have pain and it will allay it. I also suffered this way. Mr Saunders is going to Germany and is most anxious to see you, and he is so sensible and clever and always managed your teeth so well - (and the German dentists are not famous and the German teeth so bad). You ought to see him, for teeth suffer much from your condition, some people lose one every child they have and you will require to have them carefully looked at. He could go to the Rhine and then see them again when you come here next year."

In the same letter the Queen refers to Prince Leopold, her haemophiliac son then only five years old, who must have been a constant concern to Saunders:

"Leopold also saw him, and indeed everyone goes to him. It is these times one must be so careful with one's teeth, and I know you will be reasonable about it."

The Princess replied on 3rd July:

"How delighted I am to hear of Mr Saunders coming here, I shall be so thankful to see him; the very idea of losing a tooth is too dreadful, but thank heaven they are all sound as yet, and it is not one that aches but several on one side. I will not let a German dentist look at my teeth, unless it be really necessary and no one else at hand."

On the same subject the Queen again writes on 3rd September:

"Mr Saunders will be in Berlin on Wednesday next. He comes at his own expense, so just give him a little souvenir which will please and flatter him."

It seems as if Saunders would be in Germany for other reasons, either professional or social, rather than expressly to see the Crown Princess.

In 1866 Queen Victoria was concerned about the dental state of a prospective son-in-law. Her third daughter, Helena, who was the plainest of her five daughters but probably anxious to establish a home and a life of her own was, attached to Prince Christian of Schleswig Holstein. The Queen had reservations about the match but wanted a son-in-law who was prepared to live in England, as she felt that she needed the support of Helena near her. She described Christian as a penniless prince, nearly bald, who smoked 24 cigars a day and looked older than his 35 years. Also, unfortunately, he had a fair complexion causing the Queen to comment:

"I do wish we could find some more black-eyed princes and princesses for our children...fair hair and blue eyes makes the blood so lymphatic."¹⁰

When Christian was presented to her the Queen noticed not only his bad teeth but that he had a nasty cough. Surprisingly she says that she was too shy to say anything about them. Some two weeks later, however when writing to the Crown Princess, on 24th January 1866 she was able to report :

"Saunders has seen him and will do what he can. Doctor Jenner also who recommends less wrapping up and coddling and less eating, and I think when he has been here sometime he will look younger and fresher."

Only a week later she adds: "Christian looks already younger and better since he came."¹¹

Not only did "poor Christian" suffer from medical and dental problems, but he was the unfortunate target for much malicious gossip both in Britain and on the continent. The Queen writes to the Crown Princess on 19th May :

"The most atrocious calumnies have been spread of poor Christian - that he was a lunatic, had 15 children, one of whom is going to live with Lenchen [Helena], who is much vexed and annoyed."

Nevertheless Princess Helena and Christian were married at Windsor on 5th July. The Queen writes:

"She seems so full of confidence in Christian... though I wish he looked younger,¹² for he really looks older than dear Papa did at 42."

Before leaving the correspondence between Queen Victoria and her daughter there are two other letters of dental interest. The Crown Princess writes on 20th January 1880 from Pegli in Italy, where she was on holiday: "In great misery as I have just had two wisdom teeth without chloroform" [and presumably without any form of local anaesthesia]. On the other occasion, on 24th May 1883, she writes from the Hotel Bristol in Paris:

"I am staying here for a few days to see the "salon", do a little shopping and go to Mr Evans, not a pleasure for poor Vicky, who is in great want of having her teeth put right."¹³

Princess Victoria of Prussia, second daughter, then aged 17 was possibly in need of some orthodontic treatment by Thomas W. Evans, well known dental surgeon in Paris.

As already stated, any actual details of Queen Victoria herself having dental treatment are not easy to find. A biography of Sir James Reid; who was the Queen's personal physician for the last 20 years of her life, does give some insight into her occasional

dental problems. It is an accepted fact that she was a difficult medical patient and her relations with the various dentists she consulted were not always easy. Her classic comment was when Dr Reid once wished to take her temperature; she refused saying that "she preferred to leave it alone".¹⁴

On one occasion Reid received an urgent message from the Queen that a filling had quite suddenly come out from one of her teeth; "she wishes him to bring up something to stop it with, if possible before dinner this evening". Fortunately Reid, who had had a country practice in Scotland for some years before his royal appointment, was used to providing emergency dental and veterinary treatment. In the Queen's case he apparently did the necessary "with complete and permanent success".¹⁵

By the 1890s the Queen seemed to be having continual trouble with her teeth and it seems that she may by then have lost many of them. As she was frequently complaining of indigestion to Dr Reid, he suggested that perhaps she should have some artificial teeth fitted. She refused to see Mr. John Fairbank, who must have attended her previously, because he was too slow. As Reid puts it: "I fear H.M. expects impossibilities from the dentists". Fairbank was in practice in Hanover Square, London and had several other members of the Royal family as patients. He was on the Dentists Register for over 50 years and died in 1930 aged 86.

In May 1897 Reid arranged for Sir Charles Tames to see the Queen about the provision of a denture, but she refused "to let him take a cast of her mouth". By that time Tames had retired from practice, but a year later the Queen was persuaded to see his partner, Mr Harry Baldwin, and she allowed him to take some impressions. As Reid might have expected, it was not long before the Queen was "very troublesome about her artificial teeth which she constantly wishes me to alter".¹⁶

Sir James Reid had never seen the Queen undressed until after she died. During her child-bearing years it seems that she showed no reticence about pregnancy and childbirth, but it is probable that in her middle age and later she preferred to keep most of her more intimate ailments to herself. It would appear that the Queen adopted the same cautious, even unorthodox, approach to her dental problems, and usually towards her dental advisors as well.

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Lindsay Society Forthcoming Meetings

- 6th July University of Manchester Institute of Science and Technology. Dr A J N W Prag, Keeper of Archaeology, The Manchester Museum. "Reconstructing historic heads": an archaeologist in the forensic scientists' den.
- 13th November BDA Headquarters, London
Richard Havelock. "Dentistry for the deserving poor - the origins of school dentistry in West Sussex and Berkshire."

GEOGRAPHICAL VARIATIONS IN DENTAL DISEASE

C L Carmichael

Several geographical comparisons of dental health have been made in the past, but few conducted by calibrated examiners. One of the most recent was in 1986/87, in eight contrasting geographical and social areas of Britain.¹ The areas included Salford and Doncaster, representing northern industrial centres, Norfolk and Hereford/Worcester, representing Midland rural communities, Bromley and Wickham Health Authorities representing southern commuter areas, and Grampian and Fife Health Boards in Scotland. A total of 89,067 children were examined and wide differences were shown between the north of England and Scotland and the south of England and Scotland. Eight examiners, trained and calibrated in examination techniques, were involved, with two examiners used for each pair of areas. Table 1 gives the results of the mean dmf for 5/6 year old children, and the north/south gradient in caries prevalence is clearly demonstrated.

Table 1: Mean dmf for the 5-6 year old children 1986/87

<u>Region</u>	<u>Mean dmf</u>	<u>Region</u>	<u>Mean dmf</u>
Grampian	3.33	Norfolk	1.73
Fife	3.18	Hereford/Worcs	1.33
Salford	3.60	Bromley	1.31
Doncaster :	2.81	Wycombe	0.77

The authors ask, why should communities separated by relatively small distances have such different levels of disease? The reasons for these differences they say, require urgent investigation from both a planning and a scientific viewpoint.

It was ever thus. In 1925, the Medical Research Council published figures showing the incidence of caries in permanent teeth of boys and girls of different regions.² The dental examination was by one examiner and the results showed wide geographical variations. The data has been sifted and re-arranged for geographical ease of interpretation, and is presented in Tables II and III. Comparing country schools in Yorkshire and Cumberland with country schools in Norfolk and Essex, the north/south divide is again apparent. It is interesting to speculate that if the reasons for these differences had been investigated further in 1925, particularly the low prevalence in Maldon, a fluoride/caries relationship might have established many years before such a relationship was in fact correlated, as parts of Essex are natural fluoride areas.

Historically, geographical variations in dental health were first noted by Devot³ who, after examining dental rejects among French recruits in the years 1831/49, came to the conclusion that, in the higher parts of the country, there was lower caries prevalence than in river-mouth areas, apparently due to the composition of the drinking water. He published his paper in 1855.

Ten years later, Lewis⁴ published tables showing the number and ratio per thousand of exemption from "loss of teeth" in each State draft in 1863 and 1864 during the Civil War in the United States. Tables IV and V give the details with, for example, the ratio per thousand exempted for "loss of teeth" in Delaware being 6.5 compared with Massachusetts 14.4 in 1864. The 1863 extremes were Wisconsin 5.4 and West Division, New York 35.9 Lewis pointed out that there were a number of exemptions from loss of teeth; nearly one fifteenth of all exemptions in 1863 and nearly one tenth in 1864. He made comparisons with the ratio of the number of exemptions in Britain, half that of the United States, and with France and Belgium, where he found that exemptions were very many times greater in the United States than in Belgium. Comparisons between the United States, France and Belgium are given in Table VI and ratios of rejection for a number of conditions, including diseases of the nose and mouth as well as the loss of teeth are given in Table VII.

Lewis's work is perhaps historically one of the first important land-marks in what might be called the geography of dental disease, comparing exemptions for loss of teeth for military service in different countries and in different areas in the same country. 126 years later, there is still much scope for further investigations.

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Table VII: Showing Ratios of Rejections for Certain Diseases and Infirmities, in United States, Great Britain, France, and Belgium

CAUSES OF REJECTION	Ratio rejected per 1000 examined.				
	United States 1863	Great Britain 1860	France 1861	1831-1843	1851-1855
Imbecility.....	3.88	2.20	0.50	....	1.69
Epilepsy.....	8.39	....	....	1.9	0.94
Disease of brain, spinal cord, heart, and lungs.....	45.35	15.36	27.27	....	....
Consumption.....	15.00	2.26	5.00	....	....
Feeble constitution, deformity, and deficient size of chest, and curvature of spine.....	44.29	57.03	97.45	94.8	19.08
Scrofula and syphilis.....	5.16	21.13	28.52	....	10.5
Disease of the skin.....	1.92	5.54	8.63	12.51	6.34
Disease of the eye (myopia included).....	19.97	28.75	28.52	20.00	13.08
Disease of the ears and deafness.....	7.13	3.10	4.51	....	1.68
Disease of the nose and mouth.....	0.51	0.77	1.63	....	....
Stammering.....	1.76	1.31	1.63	....	....
Loss of teeth.....	20.49	9.52	7.76	8.5	0.26
Hernia.....	30.93	11.79	14.89	24.5	3.99
Haemorrhoids.....	3.59	5.00	5.88	....	....
Varicose veins.....	7.63	28.63	40.79	....	....
Varicocele.....	3.15	13.39	23.52	....	....

Table II: Medical Research Council 1925. Total percentage incidence of caries in permanent teeth - boys and girls

1. 19.64	Machynlleth	16. 14.16	The Dragon L.C.C.
2. 18.33	Crompton	17. 13.61	Casseghofa
3. 16.86	Red Hill Sheffield	18. 13.32	Leamington
4. 16.53	Rosedale	19. 12.95	Betts St L.C.C.
5. 16.22	Bath Street L.C.C.	20. 12.87	Hampstead L.C.C.
6. 16.13	Chester	21. 12.59	Shrewsbury
7. 19.09	Hartoft	22. 12.50	Cardiff
8. 15.83	Southampton	23. 12.06	Manor Sheffield
9. 15.44	Welshpool	24. 11.38	Dochhead L.C.C.
10. 15.30	Newtown	25. 11.02	Birmingham
11. 14.94	Carlisle	26. 10.68	St Peters L.C.C.
12. 14.72	Fleetwood	27. 10.49	Lewisham
13. 14.58	Ellershi L.C.C.	28. 9.86	East Harling
14. 14.26	Neuthhead	29. 8.90	Bridgham
15. 14.25	Kirkbride	30. 7.94	Maldon Essex
		31. 7.30	Thetford

32 All Schools Average 13.10 + 0.14

Table III

Total Incidence Caries - % Permanent with Caries

1. 16.06	Country schools in Yorks and Cumberland	
2. 15.37	Country schools in Wales	
3. 14.59	Sheffield schools	Sheffield
4. 13.59	Town schools	Towns
5. 13.10	All schools	Average
6. 12.97	London schools	London
7. 12.95	Betts school	Jewish
8. 12.50	Cardiff school	Cardiff
9. 12.08	Country schools	Country
10. 11.38	Dochhead school	Irish
11. 11.02	Birmingham schools	Birmingham
12. 10.87	All country schools excluding Welsh.	
13. 10.68	St Peters school	Italian
14. 7.97	Country schools in Norfolk & Essex.	

16.06	Country schools Yorks & Cumberland
15.37	Country schools Wales
12.08	Country schools, all
10.87	All country schools excluding Wales
7.97	Country schools Norfolk & Essex

14.59	Sheffield schools
13.59	Town schools
12.97	London schools
12.50	Cardiff schools
11.02	Birmingham schools

Table IV: Showing Number Examined, Number Exempted, and Ratio per Thousand of Exemptions from "Loss of Teeth," in each State Draft of 1863.

	Number Examined	Number exempt.	Ratio per 1000
Maine.....	14,305	146	10.21
New Hampshire.....	7,375	170	23.05
Vermont.....	6,719	140	20.84
Massachusetts.....	29,028	969	33.38
Rhode Island.....	4,097	92	22.46
Connecticut.....	10,818	287	26.53
South Division, New York.....	24,627	295	11.98
North Division, New York.....	27,658	385	13.92
West Division, New York.....	29,759	1,068	35.89
East Division, Pennsylvania...	36,294	623	17.17
West Division, Pennsylvania...	35,607	798	22.41
Delaware.....	2,175	19	8.74
Maryland.....	4,821	45	9.33
District of Columbia.....	4,290	59	13.75
Wisconsin.....	12,237	66	5.39
Michigan.....	5,379	68	12.64
TOTAL	255,188	5,230	20.46

Table V: Showing Number of Men Examined, and Ratio per Thousand, and Number Exempted for "Loss of Teeth," in each State in Draft of 1864

	Number Examined	Number Exempt.	Ratio per 1000
New Hampshire.....	1,441	39	27.06
Vermont.....	197	4	20.30
Massachusetts.....	6,689	270	40.36
New York.....	6,630	229	34.54
New Jersey.....	7,728	156	20.19
Pennsylvania.....	10,941	346	31.62
Delaware.....	1,692	11	6.50
Maryland.....	7,686	183	23.81
Minnesota.....	3,125	69	22.08
Kentucky.....	4,461	49	10.98
Ohio.....	10,229	193	18.87
Michigan.....	368	5	13.59
TOTAL	61,257	1,554	25.37

Table VI: Showing the Ratio of Exemptions from Military Service for Mental and Physical Infirmities in the United States, Great Britain, France, and Belgium.

	Number Examined	Number Exempted	Ratio per 1000	Number Exempt for loss of Teeth	Ratio per 1000
U.S. Draft of 1863	255,188	80,134	314.02	5,230	20.49
U.S. Draft of 1864	61,257	15,744	257.02	1,554	25.37
Great Britain April 1st, 1842, to March 31st, 1852	171,276	57,381	335.00	2,298	13.40
France 1831 to 1843 inclusive	2,097,876	680,560	324.40	17,709	8.50
Belgium 1851 to 1855	201,790	64,696	320.62	52	.26

Research in Progress

Dr Adolf Schwarz, an American member, collects items of postal matter related to dentistry, including "Mulready's letters", prepaid letter sheets which folded into envelopes and were sealed with a wax - like compound. The space on the back and sides was sold to advertisers, and in the 1840s these included English dentists. Dr Schwarz is seeking further information on these:

- Dr Allison - advertising a "teeth solution"
- Mr Clark - surgeon dentist, 23 Sackville Street, Piccadilly, late assistant to Mr Cartwright.
- Mr Lintott - surgeon and mechanical dentist, 9 Suffolk Street, Pall Mall East, and 21 Cavendish Square.
- Edward Peat - Vegetable toothpaste
- Beddome's powders
- Gregorian paste for toothache
- Hallett's toothbrushes
- Rowland's odonto on pearl dentifrice
- Sloper's portable dressing case

Dr Schwarz's address is 2017 21st Street, Bakersfield, California 99301, USA.

A LEEDS TOOTHDRAWER OF 1772

A copy of the following reply to an advertisement has been found by Dr. J.G.L. Burnby among the papers of the late Dr. T.D. Whittet (former Chief Pharmacist and pharmaceutical historian):

1772 December 26

Leeds infermere. I se it advertised in the Leeds weckle paper that you want a man to serve as apoteaker and I have been made cause to writ to you upon that account. I am a tooth drawer & Bleeder at my own home and I attend at pepels own houses when required. I am a singel man & 30 years of age & upwards... ezgues my writing for I am in hast.

Halyfax

James Cooke

Unusually, for Dr. Whittet, no provenance is given.

Christine Hillam would welcome addition information on Mr Cooke: her address is 6 Brancote Road, Oxton, Birkenhead L43 6TJ