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## THE LINDSAY SOCIETY FOR THE HISTORY OF DENTISTRY

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## DENTAL REMEDIES - A PHARMACEUTICAL HISTORICAL ACCOUNT

W E Court

From earliest times the possession of sound, even teeth has usually been considered as aesthetically desirable and, despite the removal of sound teeth as tribal ritual in some primitive societies, the main aim has been tooth preservation.

Early records (c 2000 B.C.) indicate Assyrian and Egyptian use of poppy capsules (*Papaver somniferum* L.) to deaden the pain of earache and toothache. Roman laws of the 5th century B.C. mention gold-bound teeth and burial procedures, underlining both the value of gold from earliest times and man's apparent inherent greed. Roman medicine included dentistry, and Octavia's tooth powder, which comprised charcoal perfumed with oil of spikenard from the fragrant *Nardostachys* plants of the valerian family, reached Britain at the time of the Roman invasion in A.D. 43.

Although tooth-drawing was undertaken by members of the Barbers' Guild (founded 1460) and the Barber-Surgeons' Guild (founded 1540), the readily accessible apothecaries, the forerunners of today's pharmacists, also attended to dental problems. Thus dentistry was practised by surgeons (surgeon dentists), by persons often apprenticed to watchmakers and jewellers (mechanical dentists) and by the versatile apothecaries who traded in the resins, gums and waxes used for filling dental cavities. No formal training was required - just a brass plate, brazen effrontery and persistence.

The apothecaries combined all the medical professions in their activities and, in 1703, won the right to practise medicine. Many preferred pharmacy and contributed much to the formation of the Pharmaceutical Society of Great Britain in 1841. Some pharmacists deserted pharmacy for dentistry under provisions of the Dentists Act, 1878. Compulsory registration of pharmacists commenced in 1868

and for dentists in 1921.

Dentistry pre-1800 involved at least four problem areas:

- 1) The use of medicinal agents versus toothache;
- 2) Attempts at prophylaxis to prevent or arrest disease states of the teeth or gums;
- 3) Removal of decay and filling of the resultant cavity; the major developments were to occur post-1800 as technological methods improved;
- 4) Removal of teeth and artificial substitution.

Pharmacists and their forbears, the tribal medicine men, used plants and inorganic materials in their practice.

Toothbrushing, the earliest form of oral hygiene, involved plants. Thus twigs of the Fagara species are employed in Africa and the West Indies; the stems and twigs of Salvador persica L. are used in Africa and have been formulated in modern dentifrices with claimed antibiotic and abrasive properties. In Nigeria the hairy pods of the Cnestis species are used. In modern India black Acacia twigs, stripped of leaves and thorns, are sold on trains, etc. For such twigs, the end is chewed to yield a brush-like appearance and then the teeth are 'brushed'. Only the more affluent use western-type toothbrushes.

In Europe the rays of the umbel Amii visnaga L. are known as Spanish toothpicks and, in our own country, chewing hazel wood was considered efficacious as it cleaned the teeth and hardened the gums. The acidic juice of strawberries was also favoured as it dissolved tartar.

More sophisticated brushing of the teeth involved cleaning agents. The resultant tooth powders and dentifrices were based on three types of component:

- a) an alkaline, mechanical, base cleanser, usually chalk or heavy magnesium carbonate,
- b) antiseptics e.g. borax, carbolic acid, quinine, to reduce acid fermentation between the teeth, and

- c) astringents e.g. myrrh, cinchona (tannin-containing materials); the oleo-gum-resin myrrh was particularly valued as an aromatic, local stimulant and disinfectant.

Thus Guy de Chauliac's Tooth Powder of the 14th century contained abrasives such as cuttlefish bones, sea shells, pumice, ash, iris root, salt and Aristolochia, an aromatic, bitter root with some local action on ulcers and containing aristolochic acid, a nitrocompound related to the opium alkaloid thebaine.

#### Guy de Chauliac's Tooth Powder

|                        |                     |
|------------------------|---------------------|
| Cuttle bones           | Alum                |
| Small white sea-shells | Rock salt           |
| Pumice stone           | Burnt roots of iris |
| Burnt stag's horn      | Aristolochia        |
| Nitre                  | Reeds               |

Take equal parts of each powder and mix

The 17th century apothecary Nicholas Culpeper offered much advice and recommended the burnt ashes of vine stems to scour the teeth either as powder or, with honey, as a paste. He also suggested the use of lemon juice to prevent tooth rot, the teeth being subsequently cleaned with sage-leaf powder or nutmeg powder. To clean the teeth, strengthen the gums and sweeten the breath, he also advocated vinegar of quinces.

Mouthwashes were in common use in Britain by the 18th century and were prepared from combinations of plant-derived drugs such as the disinfectants tincture of arnica, tincture of myrrh, essence of sassafras and German chamomile flowers and the tannin-containing, gum-hardening plants bilberry berries and bayberry leaf (wax myrtle).

Herbal folklore also encouraged the use of breathsweeteners such as aniseed, cardamom, clove, angelica root, mastic, mint, orris, parsley, peppermint, sweet flag, etc. Herbal dentifrice formulations included alder bark (in a vinegar decoction), charcoal, clove, lemon, mint, myrrh, nutmeg, orris, rhatany, cinchona, rose oil, sage, sassafras, soapwort (*Saponaria*), sweet flag, thyme and wintergreen.

Such plants yielded volatile oils and frequently tannins as well.

The pharmaceutical apothecaries exploited their available materia medica yielding a variety of formulations.

Tooth Paste No. 1. (Gray's Supplement, 1848)

|                       |                      |    |
|-----------------------|----------------------|----|
| Precipitated chalk    | 3                    | j  |
| Powdered myrrh        |                      |    |
| Powdered rhatany root | aa 3                 | ij |
| Powdered orris root   | 3                    | j  |
| Honey of roses        | q.s. to form a paste |    |

The chalk provided an alkaline, abrasive base; myrrh, an oleo-gum-resin from a north-east African tree, added antiseptic properties; rhatany or Krameria root from Peru or Bolivia contained tannins and provided astringency; the orris or iris root contributed a sweet violet-like odour although calcium oxalate crystals present could scratch enamel; and honey of roses permitted paste formation.

Tooth Paste No. 2. (Gray's Supplement, 1848)

|                     |                      |        |
|---------------------|----------------------|--------|
| Cream of tartar     | 3                    | j      |
| Powdered orris root |                      |        |
| Powdered red roses  | aa 3                 | ss     |
| Oil of cloves       |                      | gtl. x |
| Honey of roses      | q.s. to form a paste |        |

In this case, cream of tartar (potassium acid tartrate) functioned as an acid, cleansing agent and oil of cloves, containing the phenolic compound eugenol, provided a disinfectant action.

Although there was a logical explanation of these empirical formulae, the paste vehicle was unsatisfactory.

Mel Rosea - Honey of Roses, 1836

|                        |    |      |
|------------------------|----|------|
| Red rose petals, dried | 3  | iv   |
| Boiling water          | O  | liss |
| Despumated honey       | lb | v    |

The honey of roses was prepared by macerating rose petals in boiling water for six hours; then the despumated (heat-clarified) honey was added to the strained liquor and the mixture boiled down to a proper constituency for paste formation. Rose buds were sometimes used.

Mel Boracis - Honey of Borax, 1836

|                  |   |   |
|------------------|---|---|
| Borax powder     | 3 | j |
| Despumated honey | 3 | i |

Mix

Honey of borax, a similar preparation, was used as a mild antiseptic and astringent and detergent for tongue and fauces. Later on, it was replaced by glycerin of borax.

Unfortunately tooth pastes containing a honey base were not very stable and tooth powders became more popular. The powders usually comprised abrasives, detergents, astringents and aromatic substances and there was no honey to stick to the teeth and encourage fermentation.

Tooth Powder No. 1. (Gray's Supplement, 1848)

|                    |   |    |
|--------------------|---|----|
| Precipitated chalk | 3 | j  |
| Powdered camphor   | 3 | ij |

Mix. Keep in a bottle.

In this simple powder, the abrasive agent chalk was accompanied by the anti-infective and disinfectant camphor, a monoterpene ketone obtained from south-east Asian camphor trees or synthesised.

Tooth Powder No. 2. - Gray's Supplement, 1848

|                          |    |        |
|--------------------------|----|--------|
| Powdered castile soap    |    |        |
| Powdered orris root      | aa | 3 ij   |
| Powdered cuttlefish bone |    |        |
| Powdered prepared chalk  | aa | 3 ij   |
| Oil of cloves            |    |        |
| Essence of lemons        | aa | gtl xx |

Mix.

In this recipe soap was the detergent, orris root the main abrasive, chalk and cuttlefish bones mechanical adjuncts, clove oil a phenolic disinfectant and lemon oil provided flavour. Cuttlefish bone, often used in budgerigar cages, comprises 80-85 per cent calcium carbonate and is obtained from the squid Sepia officinalis L., hence the old name *Os sepiae*.

Colour was frequently added to tooth powders, red being particularly popular. Typical colouring agents included "dragon's blood", a red resin obtained from Indonesian palms of the genus Daemonorops. The red and yellow resins were prized as colouring and protective agents, the latter action being due to abietic and pimaric acids.

#### Tooth Powder No. 6. - Gray's Supplement, 1848

|                     |   |    |
|---------------------|---|----|
| Cream of tartar     | 3 | ii |
| Powdered orris root | 3 | j  |
| Powdered myrrh      | 3 | ss |
| Dragon's blood      | j | ss |

Mix.

Alternatively cochineal was used as in this formula:

#### Tooth Powder No. 4. - Gray's Supplement, 1848

|                    |   |    |
|--------------------|---|----|
| Cream of tartar    | 3 | ii |
| Alum               | 3 | j  |
| Powdered cochineal | 3 | ii |
| Essence of roses   | 3 | ss |

Mix.

The cream of tartar was formulated as an acid cleanser accompanied by alum as an astringent, essence of roses for flavour and perfume and cochineal for red colouring. Cochineal is obtained from the carmine-rich Dactylopius beetle found on cactus plants in the Canary Islands and Peru.

Carmine or lake were also used.

Less attractive was the formulation of charcoal, bark and myrrh:

#### Tooth Powder No. 8. - Gray's Supplement, 1848

|                   |      |    |
|-------------------|------|----|
| Powdered charcoal | 3    | ij |
| Powdered bark     |      |    |
| Powdered myrrh    | aa 3 | ss |

Mix.

It was effective, being a combination of mechanical cleanser, astringent and disinfectant. It was rather bitter to the Cinchona bark which contained alkaloids such as quinine as well as tannins.

The alternative to bitter Cinchona was catechu as in this recipe:

#### Tooth Powder - 1915

|                    |       |
|--------------------|-------|
| Powdered catechu   | 8.0g  |
| Powdered myrrh     | 4.0g  |
| Precipitated chalk | 30.0g |
| Oil of clove       | 0.2ml |

Mix. For spongy gums.

This astringent powder was advocated for spongy gum conditions because both catechu and myrrh yielded tannins. Catechu was obtained by concentrating an aqueous extract of the leaves and twigs of the Malaysian tree Uncaria gambier Roxb.

Chlorophyll is sometimes used to give a green colour to modern dental preparations.

Liquid dentifrices were popular in the late 19th and early 20th centuries. For example:

Tooth Cream - 1915

|                  |            |
|------------------|------------|
| Tr. myrrhae      | 8.0ml      |
| Ol. gaultheriaea | 0.1ml      |
| Spt. chloroformi | 2.0ml      |
| Cremor magnesia  | ad 125.0ml |

For brushing the teeth night and morning.

Magnesia countered acidity and was a mechanical base to which myrrh added a disinfectant action and the wintergreen oil and chloroform flavouring and preservative qualities respectively. Wintergreen oil was obtained from the heather Gaultheria procumbens L. and contained about 99 per cent methyl salicylate, an analgesic in some liniments and the flavour of at least one modern tooth paste.

Other formulations included tincture of quillaia to reduce surface tension and so increase the cleansing action e.g.

Liquid Dentifrice, 1915

|                   |           |
|-------------------|-----------|
| Tr. quillaiae     | 15.0ml    |
| Ol. menth. pip    | 0.25ml    |
| Ol. gaultheriae   | 0.10ml    |
| Ol. caryoph       | 0.10ml    |
| Elixir saccharini | 2.00ml    |
| Spirit rect.      | ad 60.0ml |

Quillaia or soap bark comes from Chile and is rich in saponins. The oils of peppermint, wintergreen and clove provided flavour and some disinfectant action and saccharin sweetened the product.

Alternatively pyrethrum or pellitory root, from Anacyclus pyrethrum DC., a Mediterranean plant related to chamomile, was employed for its sialogogic effect and the tingling sensation in the mouth e.g.

Mouth Wash, 1915

|                  |           |
|------------------|-----------|
| Tr. pyrethri     | 15.0ml    |
| Saponin          | 0.6g      |
| Spt. menth. pip. | 8.0ml     |
| Ol. gaultheriae  | 0.6ml     |
| Tr. myrrhae      | 15.0ml    |
| Spt. rect.       | ad 60.0ml |

Sig: The Mouth Wash. To be sprinkled on a moistened tooth brush and used for brushing the teeth night and morning.

For the gums, particularly bleeding gums, tannin-containing drugs such as krameria or rhatany root from South America and kino, the dried juice of leaves of certain south-east Asian species of Butea, Pterocarpus and Eucalyptus were used. Such sources are rich in phlobatannins. Examples are:

Dentifrice for Bleeding Gums, 1915

|                 |   |    |
|-----------------|---|----|
| Pulv. krameria  | 3 | ij |
| Pulv. myrrhae   | 3 | j  |
| Pulv. camphorae | 3 | j  |
| Creta praecip.  | 3 | ij |

Sig: The Dentifrice. Use twice a day for bleeding gums.

Tincture for Spongy Gums, 1915

|                  |         |
|------------------|---------|
| Tr. kino         | 15ml    |
| Tr. myrrhae      | 15ml    |
| Glyc. acid borle | 4ml     |
| Aq. coloniensis  | ad 60ml |

Sig: The Tincture. Half a teaspoonful in a wineglassful of water for brushing the teeth and rinsing the mouth every morning and night.

(Aq. coloniensis is Eau de Cologne, a mixture of aromatic volatile oils in alcohol).

For aphthous or ulcerated mouth, the herbalists advised the use of tincture of marigold (Calendula) which acted as a local stimulant and vulnerary. The pharmacists preferred glycerin of borax with an added oxidising agent.

Lotion for Aphthous Mouth, 1915.

|                   |         |
|-------------------|---------|
| Glycerin boracis  | 15ml    |
| Potassi chloratis | 2g      |
| Tinct. myrrhae    | 4ml     |
| Aq. dest.         | ad 60ml |

Glycerin of borax acted as an antiseptic, potassium chlorate as a disinfectant and the myrrh had stimulant, disinfectant and flavouring properties.

Good advice at folklore level was the inevitable apple a day to keep the doctor and dentist at bay as well as, from Culpeper onwards, the use of lemon juice for tooth preservation, presumably by attacking deposits of tartar.

Cleaning the teeth helped the development and preservation of the chewing apparatus but caries and periodontitis caused unpleasant problems and, therefore, much attention was given to the deadening of pain.

Primitive societies exploited the plant kingdom for suitable medication. North American Indians chewed prickly ash bark (Xanthoxylum clava-herculis L.) and Californian Indians chewed the stalks of the gold-back fern (Pityrogramma triangularis L.), a fern yielding tannins and phenols that produced astringency and disinfective properties. Other Indians used the tips of the creosote bush, dripping the sap into cavities in the teeth. Chewing tobacco leaf was also valued as a pain deadener although it also discoloured the teeth; the alkaloid nicotine numbed the exposed nerves. In Africa Fagara (= Xanthoxylum) bark is widely used by tribal practitioners as a dressing for hollow teeth, as an analgesic and as a decoction for washing out decaying teeth. Nearer home, Culpeper advocated common mustard and pepper as counter-irritants.

Willow bark has a long history and wide reputation as a cure for aches, especially headaches and toothache. Its use by the pharmaceutical apothecaries is justified because from its natural salicin, a  $\beta$ -glucoside found in the bark, two well-known

compounds have been prepared, methyl salicylate, which occurs naturally in wintergreen oil, and aspirin.

During the 1800's many treatments were popular for the treatment of odontalgia. Aconite (monkshood) was used as an ointment or liniment for facial neuralgia; the numbing effect of the toxic aconitine, the main alkaloid present, was well-known and aconite and iodine preparations were employed. Arsenic (gr 1/20 = 3mg) is escharotic and will destroy pulp; when used to combat pain arsenic was often admixed with opium although such treatment frequently initially aggravated the pain. Tannins in ethereal solution were also considered effective in the treatment of odontalgia, especially in carious states.

Creosote, obtained by distillation of wood tar, yielded guaiacol and other phenols and was recognised as a powerful antiseptic and disinfectant. Being somewhat escharotic, it also produced some local anaesthesia. Reputedly it gave relief when, in admixture with tannin or opium or chloroform, it was introduced into the decaying cavity. Conine, the extremely toxic alkaloid from hemlock (Conium maculatum L.), was dissolved in alcohol and introduced into the hollow tooth; its risky anodyne properties soon fell from favour.

Another plant drug valued by the pharmaceutical apothecaries in the 1800s and by today's herbalists is the North American gelsemium, (Gelsemium sempervirens (L.) Ait.) also known as jessamine or yellow jasmine. It was used specifically for neuralgic pains of the facial nerves. Ginger, mezereon and pyrethrum roots were regarded as useful masticatories for toothache although mezereon (Daphne mezereon L., spurge olive) was rather dangerous due to acrid resin and glycosides. Much better relief occurred when a 5 per cent solution of cocaine was applied on cotton to the carious cavity. Although phenol itself was far too dangerous to use, related compounds such as thymol, cresol, guaiacol and eugenol figured

prominently in formulations. Eugenol, in particular, although somewhat irritant, was employed to coagulate protein before filling cavities.

Typical prescriptions of the time are:

Toothache Tincture - Gray's Supplement, 1848

|         |    |    |
|---------|----|----|
| Tannin  | 3  | j  |
| Mastich | gr | v  |
| Ether   | 3  | ij |

Mix. To be applied to the tooth, previously dried, on cotton wool.

Toothache Drops - 1897

|                     |         |      |
|---------------------|---------|------|
| Creosote            | 3       | ii   |
| Ol. caryophylli     | 3       | iv   |
| Ol. menth. piperat. | 3       | j    |
| Camphorae           | 3       | iiss |
| Alcoholis           | q.s. ad | Oj   |

By the end of the 19th century interesting combinations of drugs were employed.

For example, the recipe for toothdrops in 1897 combined deadening, counter-irritant and disinfectant properties.

Analgesic Tooth Drops - 1897

|                   |      |     |
|-------------------|------|-----|
| Lin. aconit. B.P. |      |     |
| Chlorof.          | aa 3 | iii |
| Tr. capsici       |      |     |
| Tr. pyrethri      |      |     |
| Ol. caryophylli   |      |     |
| Pulv. camphorae   | aa 3 | ss  |

M. Sig: A few drops to be placed in a pellet of cotton wool and applied to the cavity.

Dentiliments for rubbing into the gums also included aconite e.g. compound aconite and iodine liniment, which was still included in the United States National Formulary VII in 1951.

Even the analgesic alkaloid morphine, extracted from the violet opium poppy capsule, appeared in tooth drops of 1897.

Tooth Drops - 1897

|                  |    |    |
|------------------|----|----|
| Morphinae sulph. | gr | iv |
| Atropinae sulph. | gr | i  |
| Aquae destill    | 3  | i  |

M. Sig: - A few drops on cotton placed in the cavity.

Atropine sulphate, derived from the deadly nightshade, *Atropa belladonna* L., was regarded as a sedative for neuralgia and caused a sensation of dry mouth; it is probably ineffective under these conditions.

Anaesthesia, although useful for killing pain, had greater application in surgery. Local anaesthesia was required for dental operations and calorific fluids were developed to promote light anaesthesia. Such formulations depended on evaporation producing a freezing, cooling effect.

Calorific Fluid - 1916

|                  |           |
|------------------|-----------|
| Chloroform       | 1 oz      |
| Rectified spirit | 2 oz      |
| Citronella oil   | 6 minims  |
| Oil of bergamot  | 30 minims |

Mix. To be applied to the gums as a fine spray, or on absorbent cotton.

The second formula included aconite as a deadener and capsicum to stimulate salivary flow and act as a counter-irritant.

Calorific Fluid - 1916

|              |   |    |
|--------------|---|----|
| Chloroform   | 3 | iv |
| Tr. aconiti  | 3 | iv |
| Tr. capsici  | 3 | ij |
| Ol. caryoph. | 3 | ss |
| Camphor      | 3 | ss |

Mix. To be applied to the gums as a fine spray, or on absorbent cotton.

Ethyl chloride was similarly used as a local deadener.

Cocaine, despite its addictive propensities and, initially, its impurity, permitted safer, painless methods for extraction without resort to the dangers of general anaesthesia. Therefore, just as in 1846 general anaesthesia with ether was a great step forward, so in 1890 cocaine opened up a new era. Pre-1400 only loose teeth were removed; in the period 1400 - 1800 powerful extraction tools meant broken jaws in some cases, but after 1890 cocaine opened up greater possibilities despite the obvious hazard of addiction.

Modification of the cocaine molecule by Einhorn in 1906 led to the discovery of procaine and opened the way to the modern local anaesthetics, for example amethocaine, lignocaine and prilocaine. Such compounds are now formulated as pastes and injectable solutions.

With improved anaesthesia and formaldehyde or paraformaldehyde, cavities could be cleaned and roots destroyed, and tooth cements and cavity liners became important. Formulations included naturally-occurring resins such as mastic, sandarac, balsam of tolu, colophony resin and benzoin. A typical recipe is the tooth cement of 1848.

#### Tooth cement - 1848

|          |    |    |
|----------|----|----|
| Sandarac | 3  | ij |
| Mastic   | 3  | j  |
| Amber    | ʒr | x  |
| Ether    | 3  | j  |

Put the ingredients in a bottle and dissolve with the aid of heat.

Remington's Handbook of Pharmacy presents several examples that are still in use. Remington (1970) recommends Friar's Balsam (compound tincture of benzoin) as a temporary and soothing coating.

Tooth fillers such as mercury-silver-ammonium amalgams were not really the province of the pharmacist, but gutta percha was part of the chemist's trade from at least 1870 onwards. Gutta percha, the purified coagulated latex of Palaquium and Payena trees from Malaysia and Indonesia, becomes plastic at 45 - 60 C and is chloroform soluble. It is still requested in pharmacies today.

False teeth caused a further pharmaceutical involvement. Denture adherent powders were prepared as in this formula from Remington's Handbook:

#### Denture Adherent Powder - 1970

|                               |       |
|-------------------------------|-------|
| Tragacanth, in fine powder    | 75g   |
| Sterculia gum, in fine powder | 25g   |
| Sassafras oil                 | 1.5ml |

Mix.

Post-1940 developments will necessitate a further consideration of, apart from technological advances, tooth paste formulations, the rise of allopathic remedies, the impact of the collapsible tube and the use of aerosol sprays.

Our professions have advanced considerably since the time when Culpeper advocated infusion of cloves in rose-water for scurvy of the gums, and sage leaf mouthwash and rub for rotting and consuming of the gums.

Over the years the pharmaceutical community employed a wide range of primarily natural products for gum treatment, toothache and neuralgia. The range of formulations used suggests a logic based on sound empirical observation and confirmed by modern chemical investigation of the specific plant materials. Thus with little scientific help the practitioners of old found the most effective mouthwashes, toothache drops, tooth powders, dentifrices and anaesthetics. Their ideas have aided us towards today's range of allopathic dental remedies.

This survey indicates that the pharmaceutical formulae played a useful role in the alleviation of dental problems at a time when technologically advanced dental practice was either unknown or not freely available. It also reveals some of the contributions my pharmaceutical forbears made to the dentist's craft.

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## EARLY DENTAL TREATMENT FOR THE POOR AT THE READING DISPENSARY

Richard Havelock and Stanley Gelbier

### Introduction

The first medical dispensary for the poor was established in London by the Royal College of Physicians in 1697<sup>(1)</sup>. The Reading Dispensary was founded in 1802 on local philanthropy, to provide medical treatment for the 'deserving poor' of the town. Its membership was 406 in 1809, although this increased gradually to 1,600 by 1870, and then dramatically until in 1898 it stood at 18,000 - a quarter of the population of the town<sup>(2)</sup>.

This had expanded enormously during the latter part of the nineteenth century because of the successful growth of several industries following the arrival of the Great Western Railway in Reading in the early 1840s. This led in turn to a considerable rise in the local population, whose demand for more and better public and professional services drew more professional men to the town<sup>(3)</sup>.

One of the most important of these industries was the biscuit producing firm of Huntley and Palmers, the number of whose employees grew from 41 in 1846 to over 5,000 at the end of the nineteenth century<sup>(3)</sup>. Initiative, energy and a concern for the welfare of their staff had made the firm the largest manufacturer of biscuits in the world. For a long time, it was also the biggest employer of labour in Reading. Well ahead of the orthodoxy of the day, Huntley and Palmers set up an employees' Sick Fund as early as 1849. Initially, all adult employees paid a contribution of 6d per week and received sickness pay of 12s per week. Employees had to be

medically examined before becoming members, but the factory doctor then provided a wide range of services, including 'cupping, bleeding, tooth-drawing and applying leeches'. The employees had to pay 1s for each initial visit, but in cases of hardship this was remitted. The scheme worked well until superseded by the National Insurance Scheme after 1911<sup>(4)</sup>.

### **The Reading Dispensary**

This was governed by those who contributed at least 10/6d a year to the Dispensary (and they could nominate two of the 'deserving poor' to receive treatment there), or who had given a single donation of £10 or more. The Governors elected from their number a President and a Vice-President, and further people each year at the Annual General Meeting to act as the Committee of Management, under a Chairman. The governors tended to be made up of the 'great and the good' of Reading society, and included in January 1870, for example, two members of the Blandy family (prominent local solicitors and bankers), two members of the Sinmonds family (local brewers), and various local clergymen<sup>(5)</sup> <sup>(6)</sup>. There were also George May and his son, George May Junior, both of whom were surgeons at the Royal Berkshire Hospital.

### **George May**

George May seems to have begun practice in Reading in 1822-3 <sup>(7)</sup>. By 1830 he had proposed that a general hospital should be established in the town, since the Dispensary was already proving unable to cope with the 'increasing need of the sick poor in the town'. However, this suggestion failed to bear fruit initially because of opposition from some of Reading's leading citizens, 'including some members of the medical profession<sup>(8)</sup>. Nevertheless, the Royal Berkshire Hospital was finally founded in 1837, and George May became one of its first senior surgeons, serving from 1839 to 1855.

In 1846, George May wrote a report on the in-patient surgery during the first six years of the Hospital's existence. It included, in a table, details of five patients who had undergone operations for hare-lip between 1840 and 1842. In a footnote, May mentions that in the case of a fourteen-year-old boy:

"....an artificial palate, with portion of jaw and teeth, was cleverly constructed by Mr Bewley, Dentist, Reading, before the operation; and the result was most successful in improving the articulation and deglutition, as well as the removal of a very unsightly deformity"<sup>(9)</sup>.

### **First moves towards appointing a dentist to the Royal Berkshire Hospital and to the Reading Dispensary**

George May (senior) relinquished his post at the Royal Berkshire Hospital in 1855, the same year in which his son, George May (junior) was appointed to a similar post, which he held until 1889<sup>(5)</sup>. It might be surmised that the son had inherited from his father an appreciation of the valuable contribution that dentistry could make to medical practice. This influence may have lain behind the proposal put before the Hospital's Board of Management on April 13th, 1869. One of its members, a Mr Merry,

"....called the attention of the Board to the benefit in- and Out-Patients would receive by the appointment of a Dentist to the Hospital, whose duties should be to attend on Out-Patient Days for the purpose of Drawing Patients' and performing any other dental operation required"<sup>(10)</sup>.

Having considered the question, the Board decided that the Medical Staff Committee should be asked whether they felt that it would be in the interests of the Hospital that 'the Office of Dentist Surgeon to the Hospital' be created. At the next Board meeting, on April 20th 1869, a letter was read from the Secretary of the Medical Staff Committee. Although supporting the principle of such an appointment, the Committee recommended that

"....he should not be called upon to give any regular attendance, but only to act when requested by any of the Medical Officers or by the House Surgeons, as otherwise inconvenience might arise especially between the latter officer and the Dental Surgeon....".

whereupon the Board decided to defer the question for the time being, presumably content to let the existing 'ad hoc' arrangements continue<sup>(Note i)</sup>.

The gathering local support for the professional status of the dental profession to be accorded institutional recognition turned next to the Reading Dispensary. Naturally, the social as well as the medical establishment of the town were deeply involved in both institutions. Apart from the cross-flow of medical men, the Hospital and the Dispensary shared a number of Governors. Amongst these were C. Blandy, one of the eminent local family firm of solicitors and bankers, and the Rev A. Purey-Cust, who was both Chairman of the Management Committee and President of the Governors of the Dispensary <sup>(11)</sup>, as well as a Governor of the Hospital<sup>(12)</sup>. Both the senior and the junior George May were Governors of the Dispensary<sup>(11)</sup> and the younger was for many years President of the Governors and Chairman of the Management Committee.

By 1870, the running of the Dispensary was giving great cause for concern<sup>(2)</sup> (Note ii). At a Management Committee meeting on January 7th 1870, George May junior proposed a motion for consideration at the forthcoming Annual General Meeting of the Governors that a sub-committee should be set up to enquire into the current state of affairs, and which would consider the feasibility of altering the institution's basis from that of a pure charity to that of a 'provident' dispensary<sup>(13)</sup>. This would allow those earning less than a designated amount to be able to become 'members' by paying a small fee regularly which would entitle them to treatment. In effect, this would be an insurance scheme, to provide what we should now call primary medical care, along the same lines as one already established at the Royal Victoria Dispensary at Northampton<sup>(14)</sup>. There was unanimous support for this proposal. May was among those elected to sit on the special committee, and he

seems to have become its chairman. Subsequent meetings were held at a feverish rate, and at a meeting of the full Committee in February 21st, May drew attention to matters which would require consideration, amongst which was 'Appointment of Dentist'<sup>(15)</sup>. The minutes of a sub-Committee meeting on February 24th refer to the question of

"Dentist - said to be desirable to provide one but nothing determined on"<sup>(16)</sup>.

In early March the Chairman, the Rev Arthur Purey-Cust, wrote a report for circulation to the governors, letting them know the conclusions of the Management Committee. It was proposed that it was still appropriate that the Dispensary should provide a system by means of which those unable to afford to pay anything could obtain free treatment, to avoid their having to apply to the Parish for Poor Law relief. However, it was argued that there were now very many more people who were able and would be prepared to contribute to some extent<sup>(Note iii)</sup>, and that if they did so then better care could be provided, as well as some additional facilities not previously available. These would include vaccination, midwifery and dentistry<sup>(17)</sup>. Finally, a Special General Meeting of governors was held on March 21st to discuss and approve the proposals<sup>(18)</sup>. It was agreed that those contributing at least half-a-guinea per year could become governors, and have the right to nominate one family or two people a year for free treatment. Honorary medical officers (and presumably honorary dentists when they were appointed in due course) would also be governors 'ex-officio'. At the same time, membership was now available under the new 'provident' scheme to 'working and other persons (including domestic servants), their wives and children, not receiving parochial relief, and....unable to pay for medical advice and attendance in the ordinary manner'<sup>(Note iv)</sup>. The membership fee was one penny per week for individuals, or two pence a week for families (including husband, wife and all children under fourteen years old). Domestic servants had to pay five shillings a year, in 'not less than quarterly' instalments. It is interesting that even as long ago as 1870, perhaps because of 'poor image' which has already been referred to, the new printed rules included the following provision:

"Any Member having cause for complaint, is to make such complaint to the Secretary, who will enter it in a book to be kept for that purpose, and submit it to the next Meeting of the Committee or Sub-Committee, which may first occur"(Note v).

Rule XXII stated that

"The Committee shall also have power at their discretion to establish a Dental Department in connection with the Institution, and to make such provisions and regulations for the conduct and management thereof as they may deem fit, and to direct that any expences (sic) attending the same be paid out of the Honorary Fund Account."<sup>(19)</sup>

At the next Committee of Management meeting, on March 31st 1870, it was decided to use the discretion allowed by this rule to establish a Dental Department, and the Secretary of the Dispensary was ordered to place an advertisement in the local newspapers, inviting applications for the post of 'Honorary Dentist'. Evidently Messrs Lyddon and Petty<sup>(Note vi)</sup>, two local dentists in partnership together, must have responded, since the Secretary reported to the Committee on May 5th that he had conferred with these two on several occasions, presumably about the range of dental treatment that they would be prepared to carry out for Dispensary patients. However,

"....they were of opinion that it would not be found convenient to repair and stop teeth at the Dispensary. They also thought that an operating chair & a set of extracting instruments should be provided by the Committee"<sup>(20)</sup>.

Perhaps Mr Lyddon and Mr Petty were concerned that providing conservative treatment at the Dispensary might threaten their private practice. The kudos of an 'honorary' appointment to the Dispensary, however, could bring the holders great benefit<sup>(Note vii)</sup>, since it elevated them above the level of the 'Medical Officers in Ordinary' - the GPs of the Dispensary, who were paid fees<sup>(Note viii)</sup>, and whose motives were often inspired by thinly-veiled self-interest<sup>(Note ix)</sup> - towards that of the 'Honorary Consulting' medical staff, amongst which George May junior was requested to accept office in 1870<sup>(21)</sup>. The Committee agreed that 'an ordinary

Dental Hospital Operating Chair' should be provided at the Dispensary, but that, rather than the Dispensary having to buy instruments, each dentist should be asked to use his own.

By January 1872, there were 5,307 members of the Dispensary - 878 from free nominations, and 4429 paying. The dental department had dealt with 242 cases, of which Mr Lyddon had seen 206, and Mr Petty 36. Although the number seen the previous year was not given, the Report for 1871 asserts that

"The increase of Vaccination, Dental and Midwifery cases shows that the provision for their treatment made by the Institution is appreciated by its members."<sup>(22)</sup>

The only recorded reward to Lyddon and Petty was in the motion carried unanimously

"....That the thanks of the Meeting be given to the Medical Officers and the Dentists for their valuable services during the past year."

## NOTES

- i. In fact, it does not seem to have arisen again until 1892! (Royal Berkshire Hospital, Minutes of Board of Management, 1889-92). Evidently the extraction of teeth for out-patients had always been amongst the House Surgeons' normal duties, and in fact ether had first been used in the Hospital for that purpose. When needed, the help of local dentists had been sought in providing either special prosthetic appliances in conjunction with surgical treatment for cleft palate or straightforward dentures to assist general convalescence.<sup>(23)</sup>
- ii. According to May, in about 1845 one of the Dispensary's subscribers discovered that there was nothing in the rules to prevent his using the nomination tickets, intended for the 'deserving poor people of his choice, for himself and his family, and so securing 'the best medical advice' very cheaply. This led to the resignation of the three honorary 'apothecaries', and to the appointment of a series of paid resident medical officers, to visit patients at home. These proved entirely unsatisfactory, since they were either young men who left as soon as they had gained experience, or else middle-aged 'medical men....who....were good for very little else.' Complaints became so numerous that it became clear that drastic changes would have to be made to the organisation.
- iii. During the first year of the existence of the Provident Dispensary, 1870-71, several people who had received nominations for free treatment voluntarily became paying Provident members, which the Committee felt demonstrated that "the funds of the Charity had to a great extent been bestowed upon those who did not require such gratuitous aid, causing thereby a direct moral injury instead of a benefit".<sup>(24)</sup>
- iv. The normal upper income limit for membership of the Dispensary was thirty shillings (£1.50) per week.<sup>(25)</sup>

v. This worked both ways, however. Over the next thirty years or so, there were a number of complaints by medical officers to the Dispensary authorities of rudeness by patients. The miscreants were sometimes threatened with expulsion from the Dispensary if they did not apologise.<sup>(26)</sup> I have found no record of any similar complaints by any Dispensary dentist.

vi. There are at the time of writing two Petty brothers running separate dental practices in Reading. However, they know of no member of their family practising dentistry in the town during this period, although they do not deny the possibility.

vii. A Reading town guide of the period<sup>(27)</sup>, published in 1882, includes a chapter about the Dispensary. Although none of the other staff are mentioned by name, it advises its readers that:

"Mr G Lyddon has voluntarily given his services as Honorary Dental Surgeon, and during the last year no less than 550 cases have been attended by him".

viii. At the Annual Meeting of the Governors in January 1871, it was announced that a total of £102-8s-9d had been divided between the 'Medical Officers in Ordinary' for their attendance on Dispensary patients during the previous six months, since the new Provident scheme had begun.

ix. George May, Jr, who later became President of the Dispensary and Chairman of its Committee of Management, evidently felt that the medical officers were excessively preoccupied with financial self-interest. In 1890, a delegation from the medical officers attended a management committee meeting to announce their refusal, without a fee, to issue sickness certificates to Board School children. May, by then Chairman, put the view of the Committee that they should co-operate, without a fee; and, to strengthen his case, pointed out the average earnings of the medical officers during the previous year.<sup>(28)</sup>

In 1902, George May (as President) referred at a Committee meeting to allegations that some of the ordinary medical staff were claiming to be honorary. He felt strongly enough to write formally to the Chairman of the Medical Staff that:

"For some months past reports have reached me that some members of the Staff are in the habit of telling their patients that they attend them out of charity.

This is very improper and is not true. In proportion to the time given, the Surgeons (medical officers) of the Dispensary are paid more than the average."<sup>(29)</sup>

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## THE ORIGINS OF PLASTIC SURGERY IN INDIA

T J S Patterson

A paper presented to the Lindsay Club in July 1989

The term 'plastic surgery' is derived from the Greek, plassein - to mould. This often leads to a misconception of the work of the present-day plastic surgeon: although he may spend part of his time re-shaping physical features (mainly, but not only, on the face), the greater part of his time is spent in reconstructing missing parts of the face and body. The former is now referred to as 'cosmetic' or 'aesthetic' surgery, as distinct from 'reconstructive' surgery. Cosmetic surgery only developed in Europe from the 1880s, but reconstructive surgery started in India - possibly as far back as 500 BC. Although plastic surgery, in the sense of reconstructive surgery, has such a long history, it is only in the last 150 years that it has become accepted as part of general surgical practice.

The repair and replacement of missing parts have always been the concern of surgeons, who have tried to find ways of speeding the healing of wounds; this, from the earliest times in India, involved the use of skin grafts. There is nothing resembling any sort of reconstructive operation in the medical systems of any of the other early civilizations, eg. Egypt and China. The first records of such reconstructive operations are those in Ayurveda, the 'science of life' of the Hindus. These records are variously dated c. 100 BC-100 AD, but it is probable that they were codifying practices that had already been in regular use for several centuries.

The knowledge of this early development of the subject in India did not reach Europe until the end of the 18th century. The first mention of any sort of reconstructive operation in the West was by Celsus (c.50 AD), who described what

would now be called an 'advancement' flap for the repair of small defects on the face, particularly hare-lip, but also for the nose and ears. It is interesting that this operation is similar to some of the Indian techniques. But it is clear that it was not very often carried out, and there is little further reference to it in the surgical literature of the Middle Ages.

In the middle of the 15th century reports began to appear that a family in Sicily had discovered the art of reconstructing missing parts of the face - in particular, the nose - using a flap of skin from the cheek. Again, this technique is similar to that described by the Hindu surgeons about 1500 years before. There is no direct evidence to link the Indians with the early surgeons in Sicily, but it is assumed that medical information was transmitted by the Arabs, who were in control of the trade-routes during the 8th to the 12th centuries, and who had learned about Indian medicine and surgery. The great Arab physicians of the 9th and 10th centuries AD, such as Rhazes and Avicenna, knew of the work of the Indians, and they incorporated much of this knowledge into their own writings.

Reconstruction of the nose from the cheek seems only to have been carried out for a short time, before the technique was altered to taking the skin from the upper arm - presumably to avoid further scarring on the face. This is the 'Italian' method of reconstruction; the principle is still valid, and it has occasionally been used until very recent times. The operation requires several stages, and the necessary fixation of the arm to the head for up to twenty days is very arduous for the patient. There is no evidence to show where the Sicilians learned this very sophisticated technique.

By the early part of the 16th century the technique had spread to the Italian mainland, and it was brought to perfection in Bologna towards the end of the century by Gaspare Tagliacozzi (1545-99), professor of anatomy and surgery in the University. In 1597, in Venice, he published his major work, *De curtorum chirurgia*

(the surgery of deformities); to this title were added the words 'per insitionem' (by grafting), the same word being used for these operations as for the grafting of plants and trees. He described in great detail the conditions for the operations (which were confined to the nose, lips, and ears), the techniques, the after-care, and the complications that could occur, with ways to prevent them. The book is in two bulky parts in Latin, and it is clear that it was not much read, and certainly not studied in detail, so that there was always a great deal of misunderstanding about its contents, and about Tagliacozzi's exact method of practice.

His results were evidently so successful, that, like all great men, he aroused envy among his rivals, who thought that, to get good results in such a difficult undertaking, he must be in league with the Devil. The operation was difficult to perform, and very arduous for the patient. Already by the middle of the 16th century it had been condemned by the great masters of surgery, who declared that no patient should have to submit to such agony, and that a false nose of wood or metal was preferable. After Tagliacozzi's death in 1599, the operation gradually fell into disuse - only a few surgeons for a few more years tried to follow his example. Soon the operation was no longer being performed, and the technique was forgotten in Europe for nearly 200 years.

The reasons for this decline are not clear, but there seems no doubt that it was partly due to the displeasure of the Church. A second factor was the prevalence of rumours that it was possible to carry out a successful graft by taking the skin from another person: Tagliacozzi's operation was long and painful, but there was no need for the patient to suffer in this way; he could hire a slave, servant, or porter, from whom the tissue could be taken - the skin usually being removed from the donor's backside. This fable was repeated and embroidered over the years.

In modern terms; this is the problem of the 'take' of a homograft (allograft). Tagliacozzi had specifically denied the possibility that this could succeed, but his

book was not carefully studied by his contemporaries, and his warnings were ignored. In addition, it was widely believed that such a graft from another individual would retain a sympathetic connection with its former owner, that it would continue to feel pain when he was injured, and that it would die when he died. This fitted in well with the ideas of sympathetic medicine that were common in the mid-17th century. It was the age of the 'powder of sympathy' and the 'weapon-salve' (with which the weapon that caused the wound was to be treated, so that the patient, even at a distance, would be more quickly healed). The case of the nobleman of Brussels was widely reported. Having lost his nose in a duel, he went to Bologna to consult Tagliacozzi. In order to save himself the pain and tedium of a graft of his own skin, he hired a porter, from whom Tagliacozzi took the necessary skin. The operation was success, and the patient returned to Brussels, leaving the porter still living in Italy. One year later, the nobleman's nose suddenly turned blue, then black, and finally dropped off. Later it was learned that the porter, in Italy, had suffered an acute illness, and had died at exactly the same time as the nose mortified.

The combination of ridicule and disbelief brought the whole subject of skin grafting into disrepute. This was the position of this branch of surgery in Europe at the end of the 18th century; the very considerable skills of the old Italian surgeons had been forgotten, and they would not be revived until the news of the practice of reconstructive operations in India reached Europe.

In October 1794, a letter appeared in the Gentleman's Magazine in London describing an operation to reconstruct a nose, which had been carried out in Poona in 1793, and had been witnessed by two surgeons of the East India Company. The letter was accompanied by an illustration of the patient ten months after reconstruction of his nose by a flap of skin from the forehead.

The patient had been employed by the British as a bullock-driver in the Third

Maisur War. He had been taken prisoner, and, as was the custom at that time, had had his right hand and his nose cut off. In this state he was returned to the British at the end of the war, and became a pensioner of the East India Company. The operation was carried out by a native practitioner of the Koomar or potter caste. The Company surgeons learned to their astonishment that this operation was not uncommon in India, and that it had been practised since time immemorial.

This was the first description of the Indian method of reconstruction to reach Europe.

The next number of the Gentleman's Magazine carried a letter commenting on this operation, and reminding readers that Tagliacozzi had previously done something similar. Great interest was aroused in medical circles by this report, and gradually further details were obtained. At the time of the operation, Sir Charles Malet was the British Resident in Poona. One day, a travelling salesman came to the door of the Residency, selling oilcloth; he was noticed to have a curious scar on his nose and another on his forehead. When questioned, he related that he had been convicted of adultery, and that his nose had been amputated as a judicial punishment. His nose had been reconstructed by a country practitioner of the potter or tilemaker caste. Malet caused the practitioner to be sent for. When he arrived at the Residency, he reconstructed the patient's nose and the noses of four other pensioners. When he was asked how he learned this technique, he stated that he had learned it from his father, and he from his father, and so back to time immemorial.

This information reached Europe at a time when there was a new and intense interest in the history of India and its arts and sciences. The classical Sanskrit texts were translated into European languages for the first time. The Western world was astonished to learn of the antiquity of Indian civilization and its culture, including medicine and surgery. It was discovered that Hindu medicine and surgery

membrane, fat, fascia, tendon - then quickly followed. Inert implants, such as ivory and paraffin, were increasingly used, but these always carried a high rate of complications.

In grafting skin all attention was concentrated on local flaps; there was still relatively little interest in the clinical applications of the second major principle of skin grafting - by 'free' transfer. This is surprising, for there was already information available that this was also a method that had long been used in India. However, it was not until 1869 that Reverdin, a Swiss surgeon working in Paris, discovered a reliable method of transplanting small pieces of completely detached skin; this is the technique known today as 'pinch' grafting. An increasing number of surgeons then began to apply free grafts to patients with burns and other injuries. In the 1870s Carl Thiersch in Germany cut the skin in larger sheets, which now bear his name, and in 1875 Wolfe, an ophthalmic surgeon in Glasgow, reported the use of the full thickness of the skin to reconstruct an eyelid. Free grafting then came to be the preferred method of transplanting skin.

The pressing need for reconstructive operations for the mass casualties of the First World War led to the establishment of firm principles for grafting all types of tissue. The resulting synthesis of the experience of many surgeons from different parts of the world heralded the modern era of plastic surgery.

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# FDI SPECIAL ACTIVITY GROUP ON THE HISTORY OF DENTISTRY: MEETING REPORT, 1989.

Stanley Gelbier

The Group held a very successful full day meeting in Amsterdam on 3rd September 1989. The programme was chaired jointly by Professor C G Lorber of Giessen, Germany and Dr F E R de Maar of Holland.

The morning's programme was devoted to the history of anatomy in dentistry. In the afternoon, the programme moved on to examine the history of dentistry in several countries.

The speakers in the morning were: Dr G Wurtz (Development of science about the embryology of teeth in the 19th century taking special account of Purkinje's research and those of his pupils Fraenkel and Raschkow); Dr W Franz (description of the anatomical structures of mouth, jaw and face in medical dissertations of the 17th and 18th century); Dr U Bauer (Opinions and theories on the histological composition of human teeth throughout the centuries); Dr C Gysel (Peter Camper, 1722 - 1789, odonto-stomatologist. On the occasion of the bi-centenary of his death); Prof C G Lorber (On the historical development of the knowledge of the temporo-mandibular joint and its function in the first half of the 19th century); Dr J Adelfang (Opinion and knowledge on scurvy in medical dissertations of the 17th and 18th century).

The speakers in the afternoon were: Dr G J Van Wiggen (A review of the start of the professionalisation process in Dutch dentistry during the 19th century); Professor M Putscher (Dental performance and work in Dutch paintings of the classical period); Dr Y Kikuchi (Dutch-Japanese relations in dentistry and surgery in earlier times); Dr H Cooray (Dental practice in Ancient India and Ceylon); Dr C Rousseau (The historical development of the dental chair); Dr Ulfmeyer (The

historical development of dosimetry in dental radiology).

During the business meeting all present thanked Professor Lorber, who was now retiring, for his leadership of the Group. The meeting heard that Dr Stanley Gelbier had been appointed by the FDI's Commission on Dental Education and Practice to replace Professor Lorber. As the new leader, Dr Gelbier now reviewed the Working Group's activities. Following the highly successful meetings in Washington and Amsterdam, no further formal lecture meetings are planned until the FDI meets in Berlin, in September 1992. Although we do not get a large number of dental historians attending the FDI World Congresses, these gatherings are extremely friendly, interesting and learned. It would be good if members of the Lindsay Society could put this date in their diary. Berlin is not far away and it will be excellent to have a good turn out for that meeting.

There was a prolonged discussion in Amsterdam on the stimulation and publication of good dental research. It is clear that dental historians from around the world are concerned that there has been no major outlet for their writings, which in itself means that the results of their work are not propagated. Therefore, there was strong support for the news that the Bulletin of the American Academy of the History of Dentistry has now been up-graded to become a refereed periodical. This means that the character of the journal should change and it will be acknowledged as the foremost place in which completed research of a major dento-historical nature will be published.

# Dental Historian cover illustration

The use of the key is described by Joseph Fox in a chapter entitled "Of extraction of the teeth" in History and treatment of diseases of the teeth, the gums and the alveolar processes, published in 1806. This is a companion to The natural history of the teeth, published three years earlier, the two books containing the substance of Fox's lectures presented at Guy's Hospital.

Plate 8 accompanies the chapter, and the legend is as follows:

- Fig. 1. The key instrument, with the claw beyond the bolster, and fixed as in the extraction of the dens sapientiae in the lower jaw.
- Fig. 2. The key instrument, with the claw before the bolster, and fixed as in the extraction of a bicuspid (sic) in the lower jaw.
- Fig. 3. The key instrument, with the claw opposite to the bolster, and fixed as in the extraction of the molares.
- Fig. 4. The key instrument, as fixed in the most proper manner.
- Fig. 5. Represents the possible consequence of using too large a claw, or of placing the bolster too low; the tooth is liable to be broken in the direction of the dotted line.
- Fig. 6. Represents the possible consequence of using too small a claw; the tooth is liable to be broken in the direction of the dotted line, across the neck of the tooth, or the claw will be broken in the centre of the curve.
- Fig. 7. The molares of the upper jaw, which were torn away by an improper mode of attempting to extract one which was decayed.
- Fig. 8. A dens sapientiae, with a large piece of jaw-bone, broken away by an unskilful application of the instrument.
- Fig. 9. Represents the manner in which teeth incline towards each other, after an intermediate one has been extracted.

typewriter upon which she had typed all Menzies' writings with an electric portable.

Her outgoing personality introduced her to many new friends in whose lives she took a sincere interest. She became a generous supporter of the annual dinners of the local branch of Graduates of St Andrews University and of the dental Fellows of the Royal College of Surgeons of Edinburgh. It was with great regret that her friends realised that increasing complaints about the deteriorating quality of the electric lighting arose from increasing blindness. Nothing interfered with her genuine enjoyment of company particularly if it coincided with a glass of sherry before her evening meal and she bore a final three year period of increasing disability with great fortitude.

The donations to the Museum of the Royal College of Surgeons of Edinburgh in 1964 and to the Library of the Royal College of Surgeons of England in 1969 shall remain as permanent memorials to an outstanding partnership devoted to the preservation of the history of the dental profession. It would be true to say that, in recent years, the profession has realised more fully how much it owes to this courteous and kindly partner of its most illustrious historian.

Henry W Noble

# RESEARCH IN PROGRESS

Saint Apollonia. Compilation of a list of all representations of St Apollonia in British churches, with a photographic record.

Dr J F Beal, Leeds Western Health Authority, General Infirmary, Great George Street, Leeds LS1 3EY.

Child health care 1907-1935. Local and national aspects, with particular relation to the work of Sir George Newman and the school medical and dental service.

Mrs H Smith, 215 Bramcote Lane, Wollaton, Nottingham NG8 2QL.

Hemimaxillectomy on President Cleveland. Extensive research has produced a mass of detail, but two special aspects are currently under investigation. 1. The dentist Hasbrouck, who assisted with the anaesthetic, and about whom little is known. 2. Demonstration of the courage and possible personality change of the President during the 15 years he survived after the operation.

Mr D N Barber, 2A Ireland Avenue, Beeston, Nottingham NG9 1JD.

### THE ROOTS OF DENTISTRY

The Society's outline history of dentistry, edited by Christine Hillam was published in May by the British Dental Journal. The annotation from the BDJ's publication list reads thus:

The Roots of Dentistry is a fascinating history of dentistry, from the third millenium BC to the present day - from caries in Ancient Egypt to toothdrawers in the Middle Ages, through to modern high tech dentistry. Topics include dentures through the ages and the agonies of tooth extraction in the days before anaesthetics.

Illustrations show many items from the British Dental Association Museum and the Wellcome Museum for the History of Medicine at the Science Museum in London, historic cartoons and book titles. You certainly don't need to be a dentist - this book will be compulsive reading for anyone interested in the history of dentistry.

Orders can be placed through any bookseller, or sent direct to Professional and Scientific Publications, P.O. Box 295, London WC1H 9TE, together with a cheque or credit card details. The book costs £9.95, (overseas £12).

### FORTHCOMING LINDSAY SOCIETY MEETINGS

14th November BDA Headquarters.  
Dr D K Whittaker: The Spitalfields exhumations.

14th February 1991 BDA Headquarters.  
Speaker to be arranged.