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Table 2

	American Whites Ref (Black)	Lapps Ref. (Selmer- Olsen)	Eskimo Ref. (Pedersen)	Pecos Indians Ref. (Nelson)	Javanese Ref. (Mijsterg)	Australian Aborigines Ref. (Campbell)	Bantus Ref. (Shaw)	Bushmen Ref. (Drennan)	Ceylonese
1	9.0	8.4	8.4	8.7	8.6	9.4	8.9	8.3	8.7
2	6.4	6.8	7.0	7.1	7.0	7.7	7.2	6.7	7.1
3.	7.6	7.7	7.8	8.0	8.0	8.4	7.6	7.5	7.8
4.	7.2	6.8	7.5	7.4	7.5	7.8	7.2	6.8	7.4
5.	6.8	6.5	6.8	7.0	7.0	7.2	7.0	6.5	7.1
6.	10.7	10.2	10.7	10.7	10.8	11.4	10.3	9.9	11.0
7.	9.2	9.3	10.2	9.9	10.0	10.9	10.0	9.7	—
8.	8.6	8.0	9.6	9.4	9.2	10.0	9.5	8.2	—
1.	5.4	5.4	6.0	5.5	5.5	6.0	5.9	5.0	5.7
2.	5.9	6.0	—	6.1	6.2	6.7	6.0	5.6	6.2
3.	6.9	6.8	7.1	7.3	7.2	7.6	7.3	6.8	6.7
4.	6.9	6.7	7.1	7.1	7.3	7.6	7.1	6.9	7.4
5.	7.1	6.7	7.1	7.4	7.3	7.7	7.2	7.0	7.4
6.	11.2	11.0	11.8	12.0	11.5	12.3	11.0	10.9	10.9
7.	10.7	10.5	11.4	11.4	10.9	12.5	11.0	10.6	—
8.	10.7	9.9	11.4	11.1	10.9	11.9	11.1	9.9	—

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A study of the Mesio - Distal Lengths of Permanent teeth of Ceylonese.

K. BAMBARADENIYA LDS. (Cey.)
L. D. S. R. O. S. (Eng.) D. P. D

The characters of teeth such as the size, shape and fissure arrangement of teeth are genetically determined. It is regrettable that after almost 30 years of organised dentistry in Ceylon, we still have to depend on British or American tables for the average size of teeth.

Materials & Method

Five hundred plastic study models of permanent dentition up to the first molar teeth, were selected from amongst those patients treated at the Dental School over a period of 10 years. The models were chosen for their clarity of detail.

Unfortunately detailed information (such as name, age, sex, ethnic group etc) was not available for every model, and the results are necessarily from a mixed sample.

Caliper with Vernier scale was used throughout the investigation. The distance from contact point to contact point was measured in the buccal teeth and wherever possible the crowns of the anterior teeth were held between the caliper arms and the readings taken.

The measurements in every instance were obtained to the nearest tenth of a millimetre.

The results were processed in the form of a frequency table. The mean and standard deviations were calculated.

The results have been compared with the mesio-distal lengths of American whites, Lappe, Eskimoes, Pecos Indians, Javanese, Australian Aborigines Bantus, and Bushmen, in a comparative table.

TABLE I

Tooth	Mean Mesio - distal length	Standard deviation
6/	11.0	0.88
5/	7.1	0.53
4/	7.4	0.52
3/	7.7	0.72
2/	7.1	0.67
1/	8.7	0.72
/1	8.7	0.79
/2	7.1	0.75
/3	7.9	0.65
/4	7.5	0.64
/5	7.1	0.55
/6	11.0	0.84
6/	10.7	0.96
5/	7.4	0.56
4/	7.5	0.63
3/	6.9	0.66
2/	6.2	0.61
1/	5.7	0.59
/1	5.8	0.57
/2	6.2	1.61
/3	6.5	0.66
/4	7.4	0.59
/5	7.4	0.56
/6	11.1	0.76

A Method of Prediction of Crowding in the Permanent Dental Arch

K. BAMBARADENIYA L. D. S. (Cey),
L. D. S., R. C. S. (Eng.) D. P. D.

Introduction

Edward Angle believed that the best balance and harmony required the presence of the full complement of teeth in a dental arch. But the later orthodontists did not find this practical. Where the basal bone was inadequate, an arch of large teeth suffered from crowding.

Expansion of the arch brought about only temporary relief. The relapse that followed was explained by Kelsey as "osteoblastic sluggishness"

Tweed and Chapman discovered that the number of teeth had to be reduced, in a jaw with limited basal bone, in order to accommodate the remaining teeth without crowding

Lundstrom and the cephalometric analyses of Broadbent & Brodie confirm the view that expansion of the jaws by orthodontic treatment does not affect the basal bone.

The ability to predict crowding in the Dental Arch is a useful diagnostic aid.

Ballard and Wylie (1947), Howes (1953) Bjork et al (1956) Stifter (1958) have attempted to find a basis for correlation of the tooth size and the arch size.

The predictive table takes into consideration two basic assumptions.

a). Growth of jaws

The post-natal increase in the width of the maxilla is absolutely as well as relatively.

Coefficient of Correlation

$$1. \quad y = a + bx$$

$$b = \frac{xy - \overline{nx}\overline{y}}{x^2 - n\overline{x}^2}$$

$$= 0.31.$$

$$a = \overline{y} - b\overline{x}$$

$$= 22.6 - (0.31 \times 23.8)$$

$$= 15.2$$

$$y = 15.2 + 0.31x$$

smaller than the increase in height and length. According to Sicher (1952) there is no significant increase in the width of the anterior part of the maxilla after the first year of life.

The increase in the transverse dimensions of the mandible due to the actual growth in width is surprisingly small. The body of the mandible in the infant corresponds closely in width to the anterior segment of the body of the mandible in the adult.

It is possible that in the first year there is a moderate increase in width due to apposition of bone on the lateral surfaces and possibly growth at the symphysis. But after the second year there is no appreciable change in these dimensions.

b). Dentition

The first molar teeth erupt at 6 years. At about the 7th or the 8th year, the incisors erupt. The canines and the premolars follow.

The space from molar to molar is occupied by the incisors, canines and Premolars. If the space is not sufficient for the teeth, crowding will result.

Method

With the values obtained for the mesio-distal lengths of teeth in the previous survey, the coefficients of correlation were determined between

$$a) \quad \frac{\text{the sum of the mesio-distal lengths of } 21/12 \text{ and } 345}{\text{and}}$$

$$b) \quad \frac{\text{the sum of mesio distal lengths of } 21/12 \text{ and } 345}{\text{and}}$$

$$\overline{x} = \frac{2 + 1 + 1 + 2}{4} = 23.8 \text{ mm.}$$

$$\overline{y} = \frac{3 + 4 + 5}{3} = 22.6 \text{ mm.}$$

$$(\text{ Where } y = \frac{3 + 4 + 5}{3})$$

$$(\text{ and } x = \frac{2 + 1 + 1 + 2}{4})$$

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2.

$$\bar{y} = a + bx$$

$$b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$$

$$= 0.43$$

$$a = \bar{y} - b\bar{x}$$

$$= 21.6 - (-0.43 \times 23.8)$$

$$= 31.8$$

$$\bar{y} = 31.8 - 0.43x$$

$$\bar{y} = \frac{3 + 4 + 5}{3 + 4 + 5} = 21.6 \text{ mm.}$$

$$(\text{Where } \bar{y} = \frac{3 + 4 + 5}{3 + 4 + 5})$$

$$(\text{and } \bar{x} = \frac{2 + 1 + 1 + 2}{2 + 1 + 1 + 2})$$

PREDICTIVE TABLE

Sum of Mesio-distal lengths of lower incisors (mm)	Space required for (mm)	
	<u>345</u>	<u>345</u>
<u>2+1+1+2</u>		
20.0	18.5	18.7
20.5	19.0	19.2
21.0	19.5	20.3
21.5	20.0	20.8
22.0	20.5	21.3
22.5	21.0	21.8
23.0	21.5	22.3
23.5	22.0	22.9
24.0	22.5	23.4
24.5	23.0	23.9
25.0	23.5	24.4
25.5	24.0	24.9
26.0	24.5	25.5
26.5	25.0	—

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Commentary

In the diagnosis of an orthodontic patient, it is necessary to assess the trends of growth and predict the changes that will take place in the dental arch.

Next to the six year molars, the earliest teeth to erupt into the dental arch are the lower incisors. By measuring the mesio-distal lengths of the lower incisors, and the spaces available for canine and the premolar teeth, one could predict the crowding that would take place in the arch by reference to the Predictive table.

If there is crowding or imbrication in the lower anterior teeth, it is usual to align them mentally into the corrected position, before the available space is measured

As a corollary, it is possible to plan the reduction of teeth so that the remaining teeth could be aligned in harmony and balance.

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Unilateral Decrease in Size of Mandible Correction by Using Silastic Implant.

Case Report

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This type of deformity may occur as part of a more extensive syndrome or may be caused by localized condylar growth defects. The former is comparatively rare and occurs as First arch dysplasia or syndrome. The latter occurs more commonly and is usually due to natal or post natal damage by either trauma or infection.

The aims of treatment of unilateral decrease in size of the mandible are:

1. To obtain functional efficiency.
2. To obtain aesthetic harmony.
3. To Prevent the occurrence of secondary defects.

Methods of treatment:

If there is ankylosis present this will have to be attended to first. Subsequently depending on the age of the patient and the nature and severity of the defect of bone and surrounding soft tissue one or more of the following appropriate measures has to be taken.

1. Serial bone grafting procedures to lengthen the mandible.
2. Orthodontic treatment
3. Onlay grafts.

Autogenous bone or cartilage, or heterogenous onlay bone grafting to restore facial contour.

4. Use of implants of artificial material to mask the deformity.

History:

A seventeen year old female was referred to my clinic for the correction of deformity of her jaws.

History revealed that she has had this condition for 10 years and that an operation was performed on the right jaw. There was pus from the operated site and it took a long time to heal. No evidence of the nature of operation or other surgical records were available.

On examination the patient had an obvious Asymmetry of the face, retruded chin and protruding upper incisors. There was a marked flattening of the left mandibular region. Below the right lobe of the ear were two old scars of about an inch resembling a scar left by a discharging sinus. It was also noticed that she had a twitching of the cheek muscles. Further examination revealed that she was unable to close fully the right eye and the angle of the mouth gets drawn to the left on smiling indicating a 7th nerve palsy.

Opening and closing of the mouth was possible. No restriction on opening the mouth, left lateral movement was not possible.

On opening the mouth there was a marked deviation to the right.

Intra oral Examination

Occlusion was completely deranged the centre line having shifted to about the right premolar region and having no occlusion except some contact in left 3rd molar region.

Teeth Present: 7654321 / 12345678
54321 / 12345678

Mucosa of cheek, tongue palate appeared clinically normal. There was no anaesthesia of lip on either side, hearing in both ear clinically normal and no history of discharge etc. from the ear.

X - rays

X-rays showed a marked deviation of the mandible to the affected side. The diminutive size of the mandible was obvious. The shape of the affected mandible resembled that of a foetal mandible. However on closer examination it was noticed that the vertical ramus was only represented by the

coronoid process and the condyloid process was almost absent. Near the angle of the mandible was a bony spur like prominence producing the ante-gonial notch which is a characteristic feature in this type of cases. Near the canine premolar region too there was a thickening of lower border showing a doubling of cortex appearance. Prominence of this type can be produced by muscular action associated with under development. However in this particular place it could well be due to periosteal reaction due to infection or evidence of an old pathological fracture.

The small mandible with a prominent coronoid process and ante-gonial notch is indicative of a potentially normal muscular environment. In first arch dysplasia there is associated muscular under development and these bony prominences are absent or poorly developed in proportion to the degree of muscular development.

A diagnosis of unilateral decrease in size of the right mandible due to localized defect in the condylar growth centres caused by neglected osteomyelitis in childhood was arrived at.

Treatment Planning

Various operations for correcting the mandibular deformity were considered. Serial bone grafting and orthodontic treatment may have been the choice if this patient reported much earlier. Now the growth has ceased and any form of bone grafting does not arise. Gross disruption in the occlusion of the teeth and the poor state of periodontal tissues rules out any form of orthodontic treatment.

Various types of osteotomies were considered and found useless. The mere size of the mandible does not allow any surgical splitting or sliding osteotomies. Again the secondary lack of soft tissue environment was against any lengthening procedures. Under these circumstances the treatment of this condition was directed towards operations of masking procedures.

In very recent times a new material which has unique properties has been introduced to surgery. It is one of the most inert material known and is very well tolerated by the

tissues of the body and produces hardly any foreign body reaction. It is available in various forms gel, sponge and blocks of varying hardness. The sponge or blocks can easily be carved to the desired shape and size with a surgical knife. It can be sterilized by suitable autoclaving. The material is dimethyl siloxane-available under the trade name SILASTIC.

It was decided to use this material as a supra periosteal implant.

Preliminary Preparation

General medical examination was arranged and was treated for slight anaemia and worms.

The mouth was prepared by thorough scaling of teeth and subgingival curettage, extraction of septic roots and the surgical removal of the buried molar in the right mandible under local anaesthesia.

Instruction in oral hygiene was given and strict supervision was maintained to see that she observed all instructions to maintain a high standard of oral hygiene.

Preparation of implant prosthesis

In restoring the external contour of the mandible it was found that a fairly thick chin and a good thickness and length of the normal mandible (left) had to be filled. Shape and size of the prosthesis was determined by cutting out a hard board with reasonable contour of mandible to fit the face-as in fig. Then another piece of hard board was cut to fill the deficient space. Taking these pieces of hard board as a guide the prosthesis was cut out of a block of Silastic. Final shaping was done by trimming and placing it over the skin of mandible to check the contour, always keeping in mind the laxity & amount of soft tissues which is available to accommodate the prosthesis.

Operation

This was done under naso endo tracheal general anaesthesia.

An incision two inches long was placed in the mandibular labial sulcus going through only the mucosa. By careful dissection a



Pre - Operative



Post - Operative



Showing the Implant in Position

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supra periosteal mucosal flap was raised and by blunt dissection lower border of the mandible was exposed always keeping as close to the bone as possible and not penetrating the periosteum.

Once the lower border was reached extensions were made on either side by a tunneling process sufficient enough to accommodate the prosthesis. The previously carved and sterilized prosthesis was placed in position and checked for any undue tension of tissues and the degree of restoration of the deformity.

Using plain catgut sutures the covering soft tissues were sutured to the periosteum so that the whole prosthesis was covered with soft tissues and maintained in the desired position. Mucosa was closed by water tight sutures using black braided silk.

Pressure bandage using elastoplast was applied over the mandible, to prevent haemotoma developing and to keep the prosthesis in position.

Patient was kept on antibiotics for seven days. Recovery was uneventful.

Post-operative aesthetic result was very pleasing.

Discussion

The maxillary protrusion was corrected at a subsequent operation. Post operative photograph shown here is before the maxillary operation.

In this case I have corrected surgically both the maxilla and mandible. The theoretical scientific way to determine as to whether there is maxillary protrusion or mandibular retrusion, or both maxillary protrusion and mandibular retrusion are present is by analysis of Cephalometric lateral skull x-rays.

In addition to the skeletal analysis techniques are also available to do soft tissue analysis. For example, according to Rickett's law of lip relationship, in the white adult the lips should be contained within a line from the chin to the tip of the nose, the lower lip slightly ahead of the upper.

However none of these so called norms were used by me. The planned correction was determined by the aesthetic eye alone. This is done by making the patient to posture the mandible forward to a normal incisor relationship. If the mandible is at fault the appearance will become normal and aesthetically pleasing. If however the maxilla is at fault a displeasing appearance of bimaxillary protrusion will result.

A satisfactory result in which the alteration may lead to an improved personality may be the difference of only a few millimeters. This can best be determined by the aesthetic eye.

Since the introduction of SILASTIC, it has been used extensively in genioplasty. I have used the same material and technique to correct the unilateral hypoplasia of mandible where there is the appearance of retruded chin. It is to be noted that the real padding was done over the normal mandible and over the chin. This method does not involve another operation to remove bone from another site and in fact the bone graft tends to get resorbed. The technique is simple and the results very pleasing.

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Dental Health In the Industrial Sector

by

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A new aspect of Dental Science known as Industrial Dental Health is being developed, parallel to Industrial Medicine in the Highly Industrialized countries.

With the present emphasis on Industrialization as an integral part of the Economic Development of Ceylon, various Heavy and Light industries have been, and also are in the process of being established by the State, and the Private Sector.

The purpose of this discussion is to draw the attention of the Dental Profession to the various aspects of Dental Health problems pertaining to the Management (Employer), and The Employee with regard to the Industrial Law and its relation to the Industrial Sector.

Some of the aspects of Dental Health in the Industrial Sector may be broadly enumerated as follows :—

1. The procedure that may be adopted for the maintenance of Dental Health among the employees.
2. The relationship of the oral Health of the workers to their particular type of work in the Food Manufacturing and packing industries, e.g. Confectionaries, Bakeries, etc.
3. The effect of various Chemical substances on the oral structures of the workers engaged in Manufacturing processes which employ metals, alloys, acids, e.g. Printing, Paint Manufacture, Rubber Vulcanising, Battery formation, Galvanizing, etc.
4. The need for Legislation for the protection of the Dental Health of the Industrial workers.

1. The Procedure that may be adopted for the maintenance of Dental Health among the employees.

In order to achieve this, it should be stipulated that an employee should become dentally fit to qualify for confirmation in the permanent service. To make the employee dentally fit the following procedure may be adopted. All carious teeth, buried roots which are beyond conservative treatment, and may later be subjected to infection and inflammation, must be extracted and the potential force of infection eliminated. Next, all the teeth which have carious lesions that can be restored functionally with conservative treatment must be attended to. The diseases of the gingivae should be treated by means of scaling, and gingivectomy thus eliminating gingival pockets, and also by advice on maintaining the health of the gingivae by the use of correct methods of oral hygiene.

Once the oral structures are rehabilitated by the procedures as suggested earlier, the missing teeth must be replaced with Dentures, so that the mouth is restored for correct and normal function.

The carious teeth and buried roots which are beyond conservation should be considered potential sources of acute inflammation and abscess formation in due course. At some stage or other the worker concerned is bound to seek emergency treatment. This leads to unnecessary loss of valuable work-time, with far-reaching ill-effects on production, leading to economic loss. By seeking emergency treatment, the worker cannot plan his medical leave, so that arrangements cannot be made for a substitute to replace him in the work-line in good time. Another serious aspect of the situation is that the efficiency of the worker drops during the period who is suffering from pain and discomfort from a carious tooth.

In order to ensure that the employees can obtain instruction regarding oral hygiene and also receive dental treatment without loss of work-time, most Industrial concerns and Trade Organizations in England and other advanced Industrialised countries maintain well-equipped Dental Clinics

manned by Dental Surgeons as part of the Medical and Welfare schemes on the Industrial premises.

The workers must be made to undergo a routine dental examination every six months, so that any dental treatment can be carried out in the initial stages. It is important to impress upon the work-force that most dental diseases are preventable by the use of correct methods of oral hygiene such as cleaning the mouth and teeth with the proper implements and using the correct techniques.

A well equipped Dental Clinic run on similar lines is maintained at the Medical Centre at Messrs. Lever Brothers Ceylon Limited.

2. Secondly, the relationship of the oral health of the workers to their particular type of work in the food manufacturing and packing industry, e.g. Confectionaries, and Bakeries, etc.

Special care is taken to see that these workers do not suffer from any infection of the respiratory track, e.g. Tuberculosis, throat and mouth infections. Attention is also directed to the maintenance of standard conditions in oral hygiene. They are specifically instructed to wear masks over their mouth and nostrils so that droplet dispersion of infection is prevented from contaminating the food that is being packed. They are instructed to restrict talking to a minimum. A very important precaution that is taken is that workers who suffer from respiratory infections frequently are transferred to other departments. Wherever they handle food material they have to wash their hands with disinfectants.

3. Thirdly, the most important is the effect of various chemical substances of the oral structures of the workers engaged in manufacturing processes, which employ metals, alloys, and acids, e.g. Printing, paint manufacture, rubber vulcanizing, battery formation, galvanizing, etc.

STONES draws attention to chemical agents, inorganic and organic which are now recognised as some of the principle causes

of occupational diseases. In the earlier industries metallic poisoning was confined to mercury, lead, arsenic, etc. but with the development of specific alloys the toxic properties of all metals demand inquiry. Though certain pure metals may be harmless their compounds and particularly their acid salts may be toxic. With the considerable expansion in the field of new synthetic organic chemicals it is necessary that there should be constant observation of the workers for any systemic or injurious effects on the oral structures, such as, the teeth, gums, oral mucous membrane and the supportive bone structure.

STONES further states that workers in the metal trades suffer from metallic stains and discolouration of their teeth. This is due to the inhalation of specific metallic dust or fumes. Copper produces a greenish stain. Iron, a blackish or greenish stain. Cadmium, a yellow or golden brown; and tin, a yellow stain.

Mercury :

Mercurial stomatitis is found occasionally to occur in workers using mercury salts due to the inhalation of the vapour. The probable explanation of the effects of mercury and other metals on the gingivae, is that the soluble salts circulate in the blood stream and when the capillaries in the gingivae are reached, the salt comes in contact with hydrogen sulphide that is formed during the decomposition of the sulphur containing food in the gingivae pockets. The hydrogen sulphide combines with the metallic salt forming the insoluble sulphide. There is thrombosis of the effected capillaries and the salt produces chronic irritation of the surrounding tissues.

ETHEL BROWNING states that the lead line or the (Burtonian or blue line) is a sign to be regarded as a manifestation of excessive absorption of lead. It consists of a deposit of dark blue and grey particles in the substance of the gum in a line about 1 m. m. from the margin. The lead having been brought by the blood stream to the gum where it is converted to the sulphide by the hydrogen sulphide arising from the decomposition of protein foods particularly in unhealthy and unclean mouths.

Premature loss of teeth:

The fact that many lead workers lose apparently healthy teeth at an early age has led some observers to regard this as a manifestation of lead poisoning. Recently evidence has been put forward by Kolesch in a series of animal experiments. He found that the jaw bones of rabbits poisoned with lead carbonate showed decalcification, erosion and progressive osteoclastosis. The mechanism of this action is attributed to a demineralisation caused by chemical displacement of the bone calcium by lead carried in the blood as colloidal secondary lead phosphate and deposited as tertiary phosphate.

Cryolite Workers:

DONALD HUNTER shows that mottling of teeth occurs in workers handling Cryolite due to the hydrofluoric acid that is liberated from the swallowed dust of Cryolite. Further he states that the teeth of the off spring of female workers handling this substance during pregnancy or during breast-feeding are mottled.

I have seen a number of patients who are workers from factories where rubber is processed by melting with sulphur. They show a loosening of their teeth and gingivae destruction. A possible explanation is the effect of sulphur dioxide and sulphur trioxide gases which when inhaled have a systemic effect on the bone and gingivae.

The Action of Acids on the Oral Structures:

In March 1959, the British Dental Association presented a memorandum to the Industrial Injuries Advisory Council of England, which concluded that Industrial Dental Erosion was a hazard which existed, and that in the majority of cases severe dental damage resulting in disfigurement occurred. Also it was pointed out that further research into the pattern and causes of dental erosion must be carried out. The Industrial Injuries Act was made law in England in 1946.

As a further investigation H. J. ten Breggen Cate from the Turner Dental School University of Manchester carried a survey between March 1962 and October 1964 among workers who handled Acids in the course of Industrial processes. The objectives of the survey were to determine: (1) The prevalence of Industrial dental erosion with particular reference to certain industrial processes. (2) The severity of the condition in those effected. (3) The rapidity of onset and advance. (4) The extent of dental treatment sought and the degree of inconvenience, disfigurement or functional disability suffered by those affected.

In his survey the following Acid processes in which exposed workers were employed; the number of firms and the Acids used were examined.

TABLE I
ACID PROCESSES ON WHICH EXPOSED WORKERS WERE EMPLOYED:
NUMBER OF FIRMS AND ACIDS USED.

Process	Acids	No. of Firms	No. of Workers
1. Battery Manufacture	Sulphuric	3	90
2. Galvanizing	Hydrochloric, sulphuric	17	114
3. Plating	Chromic nitric, sulphuric, hydrochloric, phosphoric,	9	114
4. Other acid pickling	Hydrochloric, nitric, sulphuric, hydrofluoric	13	231
5. Sanitary cleanser manufacture	Acid sodium sulphate	1	25
6. Munitions manufacture	Nitric, sulphuric	1	12
7. Sulphuric acid and Sulfan manufacture	Sulphuric	1	11
8. Soft drinks manufacture	Citric	1	5
9. Process engraving	Nitric	1	4
10. Crystal glassworks	Hydrofluoric	1	2
11. Dyestuffs container cleaning	Hydrochloric	1	7
12. Enamel manufacture	Sulphuric, hydrochloric	1	1

A few of these processes in detail will enable us to evaluate the significance of his survey.

Battery Formation Process:

In this process lead plates were placed vertically in tanks and connected up to make an electrical circuit by means of lead bars, which were tagged on to the plates with a blow torch. The tanks were filled with dilute sulphuric acid the specific gravity varying between 1.02 and 1.15. A current was passed which charged or formed the plates. This caused small bubbles of hydrogen to be given off. The bubbles rise rapidly to the surface and burst causing a fine acid mist. This mist is capable of causing severe dental erosion. It was noticeable that men working in the charging departments, and some inspection workers showed less erosion than formation workers. There is less acid in the atmosphere of charging departments as the completed batteries have lids whereas the tanks in the formation process are open.

Galvanizing:

Hot dip galvanizing consists of coating clean iron surfaces with zinc in order to protect the surface from rusting. The acid used to clean the iron is usually hydrochloric though sulphuric acid is occasionally employed. Depending upon the type of work being treated, the metal is pickled in hydrochloric acid which varies in strength from commercial concentrated acid diluted 1:1 with water. Hydrochloric acid is generally used at room temperature, and fuming is worse in warm weather. The workers employed on stages of the processes other than pickling, for example, zinc dipping, are referred to as non-picklers. It was observed that 20% of the non-picklers were affected by erosion compared with 57% of the picklers. The picklers were more affected in all grades including

etching and it is considered that the higher prevalence is due to more direct contact with acid. Of all galvanizing workers 7.5% were affected by grade 2 or grade 3 erosions compared with 20% among battery formation workers.

Plating:

This category covered workers in chrome and nickel plating and specialized zinc plating. Metal surfaces were generally acid etched prior to plating. The plating solutions themselves were acidified; for example in chrome plating chromic acid with one part of concentrated sulphuric acid is added per hundred parts of chromic acid.

Other processes:

- Ammunitions manufacture
- Sanitary cleanser manufacture
- Crystal glass workers
- Enamel manufacture.

The classification of the grades of erosion that were used in his survey by Breggen Cate:

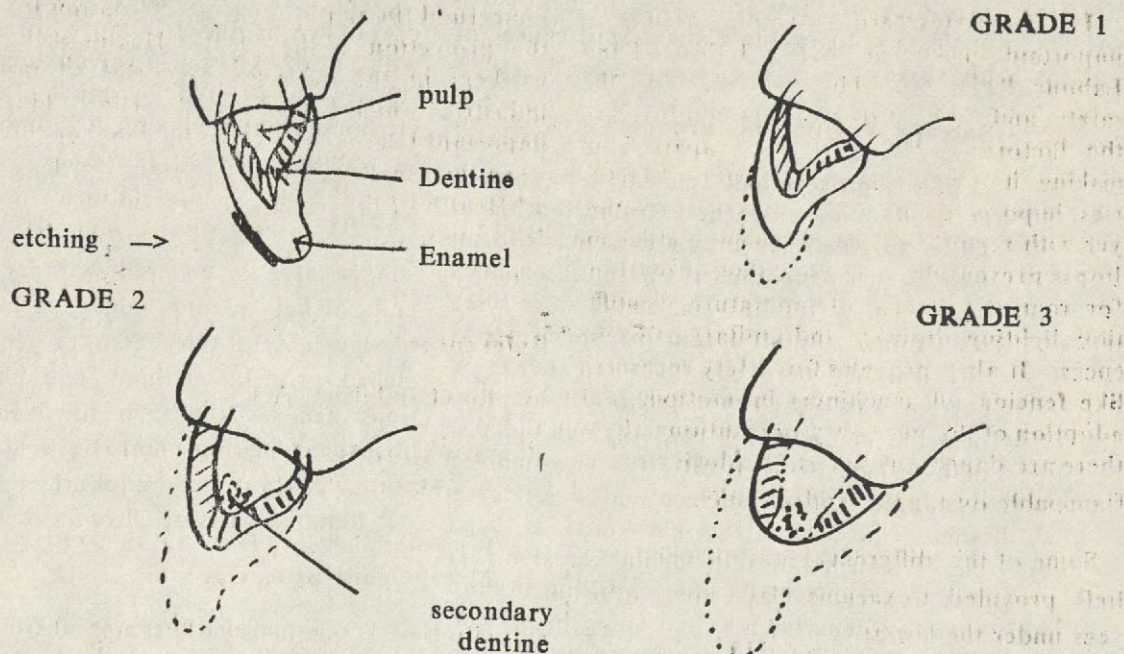
1. **Etching:** (Et.) This consisted of a dull, ground-glass appearance of the enamel surface without loss of contour:

Grade 1, Erosion: G. 1. Loss of enamel only.

Grade 2, Erosion: G. 2. Loss of enamel with involvement of dentine.

Grade 3, Erosion: G. 3. Loss of enamel and dentine with the exposure of secondary dentine.

Grade 4, Erosion: G. 4. Loss of enamel and dentine resulting in pulpal exposure.



The Classification of Erosion. (GRADES)

The Roll of Attrition :

The enamel of acid erroded teeth is abnormally fragile at the surface. He found that the acid erroded enamel is more easily wasted than the normal enamel. Erosion and attrition operating together may cause more rapid loss of tooth structure than either operating alone.

The Influence of lip posture :

It was found that acid workers breathed through their mouths when the acid level in the atmosphere became so high that nose breathing became unpleasant. Workers with protrusion of the upper teeth show more erosion of the labial surfaces of the teeth.

The methods used for the elimination of acid fumes from the working environment :

In his Survey of the factories he found in general the complexity and the efficiency of exhaust and ventilation systems were related to the concentration and the temperature of the acid. Thus if there was heavy emission of fumes, lip extraction was usually employed. This consists of an exhaust system

drawing fumes into an opening around the lip of the acid vat and preventing escape into the atmosphere. If there were acid fumes escaping into the atmosphere of the work place, roof and wall fans were employed. Another method is by natural ventilation where the building containing acid fumes is kept open by having no walls.

Sometimes, chemicals are used to reduce the spray and fuming of acids. Surface tension reducing agents known by their trade names as "Zeromist" and "Teepol" are added to the vats containing acid. Both these products operate by forming a foam on the surface of the acid. The foam traps bubbles rising to the surface which causes the spray and also prevents fuming and evaporation.

Breggen Cate observed that hydrochloric acid and sulphuric acid account for more erosion than nitric or hydrochloric acid.

The observations made by Breggen Cate on the Dental Health of the workers handling acids and metals during the manufacturing processess mentioned earlier, may be very useful, in a similar survey of this nature in Ceylon.

The Factories Ordinance in Ceylon is an important enactment in the Industrial and Labour Relations. This provides for the safety and welfare of workers employed in the factories. This ordinance apart from making it compulsory to register all factories, imposes duties on the owner or employer with regard to the maintenance of cleanliness preventing over-crowding, provisions for regulating proper temperature, ventilation, lighting, drainage and sanitary conveniences. It also provides for safety measures like fencing off machinery in motion, and adoption of the necessary precautions where there are dangerous fumes, explosive or inflammable dust, gases and vapours,

Some of the different kinds of social reliefs provided to various classes of employees under the law are :

1. Medical Care
2. Maternity benefits.

What I would like to point out is that none of these Acts cover or have taken into consideration the Dental Health of the workers. I think it is time we should as a Professional Body bring to the notice of the authorities

concerned the importance of Legislation for the protection of the Dental Health of the workers in the various categories of the industries which I enumerated earlier. This important Legislation will induce the employer to take notice of the importance of Dental Health of the workers which in turn will lead to conditions of better productivity and economy.

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6. Factories Ordinance
7. Medical Care Ordinance
8. Maternity Benefits Ordinance

Special Law and the Dentist.

V. CUMARASWAMY

L. D. S. (Cey.)

The world has known, according to an American Scholar, 16 different systems of law of which half are extant. Foremost amongst the systems still in operation are the English, Roman and Mohammedan. The law of England, Wales, Ireland, Canada, Australia, New Zealand, various colonies and dependencies is basically English common law. Growing up in unwritten form, customs of the people were declared as 'dooms' or ordinances by the King and much of this was carried in men's minds without being written down. One of the main objectives throughout the British Constitutional development was the establishment of the 'Rule of law'.

In Britain there is no separate set of Administrative courts such as parallels the ordinary courts in France, Germany and other continental countries. This, in effect, implies that all are equal in the eyes of the law and that therefore everyone is liable in case of infraction to punishment irrespective of his station or connections. In practice, today every citizen does not have equal duties and responsibilities. Some may have extra duties and responsibilities peculiar to their particular profession, trade or calling and it will be useful to study this aspect in relation to the political constitution of our country and governing body of the dentists vis-a-vis the British Constitution and the General Dental Council.

Dento-Legal History.

Tooth drawing was long an itinerant occupation at Fairs to the notes of drums, used partly to call attention to the performance and the performer and partly to

drown the shrieks of the victim. The Scientific study of the diseases of the teeth dates back to John Hunter and his treatises, 'The Natural History of the Human Teeth' in 1771. Tooth drawing became dentistry in the 18th Century. It soon became lucrative and scientific when Rogers and Tomes placed it on a broad foundation. They were helped by a band of enlightened men who insisted that there should be a preliminary training in both theory and practice which should be tested by subsequent examinations. The Dental Society was formed in 1856 and is now known as the Faculty of Dental Surgery of the Royal College of Surgeons while the oral medicine section continues as the Odontological section of the Royal Society of Medicine.

Dental Surgery soon became an established medical discipline and the same code of ethics as for physicians was required to be observed by the dentists. Not all practitioners lived up to them as no calling in life is comprised solely of the virtuous and in 1858 a Medical Act was promulgated to regulate the qualifications of the practitioners of medicine and surgery and contained the first real laws affecting the practice of dentistry. This was followed by the Dentists Act of 1878 the major legislative step to protect the public and regulate dental practice. The Main effects of the Act were to establish a Dentists Register, to restrict the use of the title 'dentist' and to disable unregistered persons from recovering fees.

The Dentists Act of 1921 established the Dental Board of the United Kingdom and gave power to a limited extent to administer themselves. Between the years 1921 and 1957 a number of minor Acts affecting the Dental Profession were passed. By the Dentists Act of 1957 dentists were given complete control of their own profession, subject only to certain over-riding powers vested in Her Majesty's Privy Council.

Yet the privilege possessed by persons medically qualified to practice the whole range of dentistry, if they wished, without training or dental qualification or registration has not been withdrawn. This perhaps has been left to the good sense of the medical colleagues. Further Part IV of the Dentists Act of 1957 gave power to the General Dental Council to keep 'record or roll' of unregistered persons who were allowed to carry out 'minor dental work' under Supervision in any public dental service and charged them with the duty of enforcing standards of conduct among ancillary workers. Still there are legal loop-holes as the definition of the practice of dentistry which appears in the 1957 Act is substantially the same as in the Act of 1921. Unregistered persons can still make, supply and repair dentures as long as no work is done in connection with the fitting insertion or fixing of them in the mouth.

'Rule of Law.'

The political constitution of Ceylon is based on the principle of parliamentary democracy and is in most part derived from the British Constitution. The particular principle which distinguishes the British Constitution from foreign democratic constitutions of the world is what is termed the 'rule of law'.

In parliamentary democracy the ultimate Sovereign authority within the state is shared by or vested in the people. Whatever this may mean the ultimate supremacy and legal omnipotence of the parliament may lead one to wonder what protection the individual citizen has against infringement of his personal liberties. In Foreign constitutions the mode of guaranteeing personal liberties is by enumerating them in the written constitution as 'Bill of Rights', Declaration of fundamental Rights etc. Not that in the British Constitution and Constitutions of the Commonwealth there is a lack of constitutional guarantees like the habeas corpus, writ etc., but of all else stands the most precious of all principles of English polity the 'Rule of Law' a principle not much different from that to which King John agreed at Runnymede in 1215 - the 39th article of Magna Carta. The translation reads:—

"No free man shall be taken or imprisoned or disseised (ie deprived of his lands) or outlawed or in anyway destroyed, nor will we go upon him except by the lawful judgement of his peers or the law of the land"

This principle of the 'rule of law' had been recognised by different monarchs and even by Parliament a number of times during the course of the development of the constitution and existed in a rather unsystematised and incomplete form in the early decades. It was left to Dicey, Professor of Law at Oxford to give it a definite formula and political basis and absorb it as another ingredient of the constitution in the 19th century. Dicey analysed the 'rule of law' as comprising (a) The absence of arbitrary power (b) No man is above the law and (c) Principles of the constitution are the result and not the source.

Special Law.

Analysing the principle 'no man is above the law' Dicey was emphasising the absence of extra ordinary tribunals like the "Droit Administratif" of France. Dicey also emphasised the supremacy of the ordinary law over 'special law' In this connection the factor that requires consideration is the existence of 'special law' and the extent to which it is consistent with the ordinary law. It may happen that a citizen may be governed by the ordinary law that is universally applicable and also be subject to a 'special law' by reason of his particular calling. In the modern era doctors, dentists, lawyers soldiers and clergy are all subject to the 'special law' by reason of their professional pre-occupation. Dicey's view that in eyes of the law all persons are equal irrespective of race, rank, sex, etc., may have had some application in his time but has no validity today as we are subject in addition to the 'rule of law' to the 'special law' of our governing body the Ceylon Medical Council.

Ceylon Medical Council.

Since the Imperial Parliament established by statute the General Medical Council in the United Kingdom in 1858 a number of medical bodies comparable in constitution and in functions have been established in the colonies and Commonwealth Countries. The constitution composition and functions of the Ceylon Medical Council remain unchanged even after Ceylon became a Commonwealth Country. The Council consists of eleven members—five members including the President are nominated by the Minister of Health, four members are elected by the medical practitioners, one member elected by the teachers of the faculty of Medicine University of Ceylon and one member elected by dentists.

The General duty of the Council is to protect the public by endeavouring to establish a high standard of medical and dental education, by keeping and publishing registers of duly qualified doctors and dentists and taking disciplinary action in cases of criminal convictions or "infamous conduct in a professional respect."

'Infamous Conduct'

It has always been held by the Council that a criminal conviction in court against a practitioner whether or not it is directly concerned with professional practice renders him to erasure. In cases of criminal convictions the council must accept as proved the findings of fact by the courts.

In those involving professional misconduct the case is tried ab initio irrespective of the findings of any other disciplinary body. The meaning of "infamous conduct in a professional respect" has so far not been fully defined. Lord Justice Lopes defined the phrase "infamous conduct in a professional respect" as follows:—

If a medical man in the pursuit of the profession has done something with regard to it which will be reasonably regarded as disgraceful or dishonourable by his professional brethren of good repute and competency then it is open to the General Medical Council, if that be shown, to say that he has been guilty of 'infamous conduct in a professional respect.'

The Council does not punish those found guilty in a retributive sense. Their primary duty is to protect the public and the primary consideration is whether it is in the public interest to allow them to be in the Register. What may be in the interest of the professionals concerned is only a second consideration.

Types of Offence.

In the light of General Medical Council's experience over the last hundred years a number of types of offence is indicated:—

- (1) Abuse of a doctor's knowledge, skill or privileges.

Illegal abortion

Improperly purveying dangerous drugs.

- (2) Abuse of a relationship between doctor and patient.

Adultery with a patient.

Improperly disclosing information obtained in confidence from a patient.

- (3) Disregard of personal responsibilities to patient.

Gross neglect in diagnosis or treatment.
"Covering" medical practice by un-registered persons.

- (4) Offences indicative of tendencies dangerous to patients

Convictions arising out of abuse of alcohol.

Addiction to drugs.

- (5) Offences discreditable to the doctor and his profession.

Convictions for false pretences
forgery, fraud theft, indecent behaviour.

- (6) Issuing untrue or misleading certificates.

- (7) Improper attempts to profit at the expense of professional colleagues.

Canvassing for patients.

Advertising for the doctor's own professional advantage.

Depreciation of other doctors.

- (8) Abuse of financial opportunities afforded by medical practice.

Improperly obtaining money from patients.

Commercialisation of a secret remedy.

Improperly prescribing drugs or appliances in which a doctor has a financial interest.

Fee-splitting.

Neither the categories nor the instances given above are complete or exhaustive. It is not possible, and with changing circumstances, it will never be possible to compile a complete list of the matters which may lead to disciplinary action on the part of the Council.

Dentists.

Between 1922 and 1958 the Dental Board and Council considered 131 cases in which dentists were convicted of criminal offences and ordered erasures in 47 cases. They were guilty of incest, fraud embezzlement, larceny drunkenness, drug addiction and repeatedly travelling without tickets.

Between 1922 and 1958, 298 cases of infamous conduct in a professional respect were the subject of inquiries and erasure was ordered in 73 instances. These are for "covering", advertising and canvassing, false certification, adultery with patients and fraudulent registrations.

General Dental Council.

The Dentists Act of 1957 states that the general concern of the General Dental Council shall be 'to promote high standards of professional education and professional conduct among dentists' and assigns to the Council the following duties:—

1. Keeping the Dentists Register.
2. Maintaining professional discipline.
3. Supervising dental education and examination.
4. Establishing classes of ancillary dental workers and supervising their training examinations and discipline.
5. Carrying out an experimental scheme for the training and employment of dental auxiliaries.

Composition.

The General Dental Council consists of 43 members appointed as follows:—

1. Eleven elected by registered dentists from among themselves.
2. Three registered dentists nominated by the Sovereign on the advice of the Privy Council.
3. Three laymen two from England and one from Scotland appointed in the same manner as in (2) above.
4. One layman nominated by the Governor of Northern Ireland.
5. Nineteen registered dentists appointed by the dental authorities ie one for each authority except for the University of London which may appoint two.
6. Six members nominated by the General Medical Council from among their members. These six members act and vote as members of the General Dental Council in connection with dental education and examinations but not for any other purposes.

Disciplinary Committee.

All disciplinary cases are first examined by the Preliminary Proceedings Committee and a decision made whether or not a particular case be referred for hearing before the disciplinary committee. This body consists of the President and 10 other members of the Council of which 4 must be elected members 2 must be laymen and none but the President, may be a member of the Preliminary Proceedings Committee.

The procedure followed in inquiries by this Committee is similar to that in a court of law. Witnesses can be compelled to attend and evidence is taken on oath and accepted rules of evidence of the criminal court are generally observed.

Appeal

Any dentist not satisfied with the order of erasure of his name from the Register by the Council can within 28 days of the decision appeal to Her Majesty-in-Council and the appeal will then be considered by the Judicial Committee of the Privy Council.

Conclusion.

The dentists in Ceylon have so far not had the opportunity to administer their own affairs with the result that there is little or no control of the practice of dentistry by persons without training or qualification. The evils associated with unregistered practice continue unabated and it is now ripe for the profession to stir parliament into action and to effectively close the profession to all except registered practitioners

and make a dental qualification from a recognised teaching institution a prerequisite for future entry in the Register. The desire of the profession must surely be to move towards self-government and establish early by statute our governing body the Ceylon Dental Council.

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The School Dental Nurse

NEIL GUNAWARDHANA
(L. D. S. Cey.)

The School Dental Nurse is an operating auxiliary, who according to the classification of the W. H. O. Inter-Regional Seminar on the Training and Utilization of Dental Auxiliaries in Developing Countries, is a person, who is not a professional, but is permitted to carry out certain treatment procedures in the mouth under the direction and supervision of a professional.

The distribution of School Dental Nurses in the World today is as follows:-

Australia 12, Burma 13, Ceylon 225, Hong Kong 12, Italy 2, Kenya 1, New Zealand 1182, Sabah 14, Sarawak 37, United Kingdom 218, West Malaysia 335.

The system of providing dental care to children through the School Dental Nurse originated in New Zealand, where the first group of nurses began their two year Course of training in 1921. Today there are three training schools in New Zealand, and one each in Malaysia and Ceylon; more recently, it has been reported that nurses have been trained in Hobart, Tasmania and Canberra, Australia. The Privy Council of the United Kingdom required the General Dental Council to undertake an experimental scheme for the training and employment of Dental Auxiliaries, and in 1960, the School for Dental Auxiliaries was established at New Cross.

The Scope of Work In the United Kingdom

The School Dental Nurse or the Dental Auxiliary is permitted to work only within the National Health Service. Auxiliaries are not permitted to work in general dental practice.

Regulations provided by the Privy Council and the General Dental Council require that dental auxiliaries must work under the direction of a registered Dentist, who examines the patient and indicates to the

auxiliary the treatment plan to be undertaken for the patient. The auxiliary is neither trained nor permitted, by law to diagnose and plan treatment for children. Regulations indicate that a dental auxiliary may perform the following:—

- i) simple dental fillings using amalgam, silicate, silicophosphate, and oxyphosphate cements.
- ii) extraction of deciduous teeth under local infiltration anaesthesia.
- iii) scaling, cleaning and polishing teeth.
- iv) application of sodium or stannous fluoride.
- v) dental health education

Operations on the dental pulp, treatment or filling of root canals, restoration of fractured incisors, gold inlays, crowns, space maintainers, dentures, and the use of nerve block anaesthesia are absolutely outside her scope.

In Malaysia

The School Dental Nurse is a member of a dental team, and auxiliary to a qualified Dental Surgeon, just as much as a Physiotherapist or a Radiographer are valuable aids to the Medical Officer. Tedious routine work and repetitive procedures are thus eliminated, enabling the qualified Dental Surgeon to devote his time to more complicated and important work.

The dental nurse works under the Dental Surgeon's professional control and supervision, which as far as possible, is direct; when direct supervision is not possible, as in the case of too small clinics which cannot accommodate both a Dental Officer and a Dental Nurse, the principle that the Supervision should be as close as possible is adopted. In every case, whether under direct supervision or not, every patient whose treatment plan has been completed is checked by a Dental Surgeon, and the fact recorded on the patient's treatment card.

A School Dental Nurse's work includes:—

- i) Standard cavity preparations and silver amalgam fillings in permanent pre-molars and molars.

- ii) Copper amalgam fillings in deciduous teeth.
- iii) Extraction of deciduous teeth.
- iv) Relief of pain in the form of dressings.
- v) Pulp capping for traumatic exposures.
- vi) Instructions in oral hygiene.
- vii) Dental Health Education and propaganda.
- viii) Treatment of very simple gum conditions.
- ix) Scaling and polishing teeth.
- x) Zinc oxide dressings or temporary cement fillings for permanent anterior teeth if patient cannot be referred to a Dental Officer.
- i) Standard cavity preparations and placing fillings in primary and permanent teeth.
- ii) Extraction of teeth under local anaesthesia.
- iii) Application of topical Fluorides.
- iv) Cleaning scaling and polishing of teeth.
- v) Pulp capping.
- vi) Draining infected teeth presenting as emergencies.
- vii) Placing dressings for the relief of pain.
- viii) Dental Health Education.

Situations beyond her scope have to be referred to a qualified Dental Surgeon.

In New Zealand

The school Dental Nurse is primarily employed within the School Dental Service which is an integral part of the National Dental Service. She works under the general control of the Principal Dental Officer of the area, who conducts random checks of the clinical work and deals with any specific queries raised by the Dental Nurse. He is assisted in his supervision by a Dental Nurse Inspectress, who makes frequent and irregular visits and supervises the cleanliness and tidiness of the clinics and checks the accuracy of the records maintained. She may also render assistance with troublesome cases and the problem of broken appointments.

A school Dental Nurse maintains the dental health of a group of patients, usually 500, by regular dental inspection, treatment and health education. At the commencement of regular treatment, the Dental Nurse decides on the course of treatment for each child. Her normal duties include:-

In Ceylon

The School Dental Nurse is permitted to work only within the School Dental Service of the Department of Health. She is not permitted to work in general practice. There are 120 clinics, the majority attached to schools, functioning in all parts of the Island. The nurses work under the supervision of three supervising School Dental Surgeons, whose functions are similar to those of the Principal Dental Officers in New Zealand. In fact, the entire School Dental Service is based on similar lines as those in New Zealand.

A Dental Nurse is responsible for maintaining the dental health of about 700 children, between 4 and 12 years of age, by giving them systematic care every six months. Her scope of work is identical to that of her counterpart in Malaysia.

The establishment and distribution of School Dental Clinics in Ceylon.

LOCATION	1956 PRE '56	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	TOTAL
Colombo	7	—	8	3	3	2	6	3	3	3	5	—	1	2	46
Galle	—	—	—	—	—	—	—	1	4	—	3	2	1	1	12
Kandy	—	1	—	—	1	—	—	1	1	2	2	3	—	—	11
Kegalle	—	—	—	—	1	—	—	—	—	1	5	—	2	—	9
Kalutara	—	—	—	—	—	—	1	3	—	1	—	—	—	—	5
Matara	—	—	—	—	—	—	—	—	3	2	—	1	—	2	8
Ratnapura	—	—	—	—	—	—	—	—	—	1	1	1	1	2	6
Kurunegala	—	—	—	—	—	—	—	—	—	2	2	1	3	2	10
Jaffna	—	—	—	—	—	—	—	—	—	—	1	—	—	2	3
Badulla	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
Puttalam	—	—	—	—	—	—	—	—	—	—	—	—	2	1	3
Matale	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2
Batticaloa	—	—	—	—	—	—	—	—	—	—	—	1	—	1	2
Anuradhapura	—	—	—	—	—	—	—	—	—	—	—	—	1	—	2
TOTAL	7	1	8	3	5	2	7	8	11	12	20	9	12	15	120

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Dr. Stanley L. Cramer: An Appreciation

FOR THE CONNOISSEUR

By the death of Dr. Stanley L. Cramer the country has lost a worthy citizen the dental profession a progressive and enlightened member, and the medical service an efficient and enthusiastic officer, writes Dr. A. Annesley Gomes.

Even with failing health and against the advice of his colleagues he was at his post at the Dental Institute on the day before he died, so that the news of his death came as a shock to all his friends.

It was this indomitable spirit which brought Dr. Cramer from the position of an assistant in the chemist's department of a Fort shop to the senior ranks of the Government medical service. Later when there appeared to be an increasing demand for dental treatment, he saw a fresh field for his energetic disposition and specialised in dentistry.

On his return to Ceylon with British qualifications he was appointed Schools Medical Officer of Colombo. The School dental clinics will ever remain a memorial to his name.

About the year 1933 the Ceylon Dental Association placed before Dr. Briercliffe a scheme for a post-graduate dental school; when the school was eventually opened Dr. Cramer was appointed the first Registrar, while at the same time he was Visiting Dental Surgeon of the Dental Institute. Despite very discouraging circumstances

in connexion with the dental school which nearly caused a precipitate closure of the school without the holding of examinations and the granting of Diplomas, Dr. Cramer once again fought the good fight and carried the course of studies to completion. The six post-graduates who now possess their dental diplomas have reason to be thankful to Dr. Cramer for them.

As a member of the Ceylon Dental Association he was equally invaluable. His contributions to the discussions at the meetings were marked by their practical common sense, and his energetic will suffered no dilatoriness. He always took a prominent part in the activities of the Association.

Socially, Dr. Cramer counted a large circle of friends. He was above all a staunch and loyal friend and will be missed by many.

(This appreciation which appeared in the Newspapers when Dentistry in Ceylon was in its infancy was contributed by Major F. R. I. Bartholameusz, L. D. S. (Ceylon), D. P. D.)

JANUARY 14, 1970

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LOCATION

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The establishment and distribution of School Dental Clinics in Ceylon.

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