CEYLON DENTAL JOURNAL

VOLUME 2

DECEMBER 27 1971

THE JOURNAL OF THE CEYLON DENTAL ASSOCIATION

WITH BEST COMPLIMENTS

OF

CHIVKONZER & Co.

DEALERS IN

DENTAL MERCHANDISE

(THE DENTAL PEOPLE)

10, 2ND CROSS STREET,
COLOMBO 11.

PHONE: 24530

CEYLON DENTAL JOURNAL

THE JOURNAL OF
THE CEYLON DENTAL
ASSOCIATION

5 WIJERAMA ROAD
GANGODAWILA
NUGEGODA

VOLUME 2 DECEMBER, 1971

CEYLON DENTAL JOURNAL

Editor

NEIL GUNAWARDHANA
L.D.S. (Ceylon)

Honorary Scientific Advisers

S. SIVASUBRAMANIAM
L.D.S. (Ceylon) Dip. Orth, R.C.S. (Eng.)

V. S. KARUNAGARAN
L.D.S. (Ceylon) F.D.S., R.C.S. (Edin.)

G. S. AMARASEKARA
L.D S. (Ceylon) F.D.S., R.C.S. (Eng.)

Advertisement Manager

L. S. W. DASSANAYAKE
L.D.S. (Ceylon)

CEYLON DENTAL ASSOCIATION

Honorary Office Bearers for 1971/72

President:-
A. NAGENDRAN
L.D.S. (Ceylon

Vice President:-
A. R. ABEYASINGHE
L.D.S. (Ceylon) L.D S.R.C.S. (Eng)

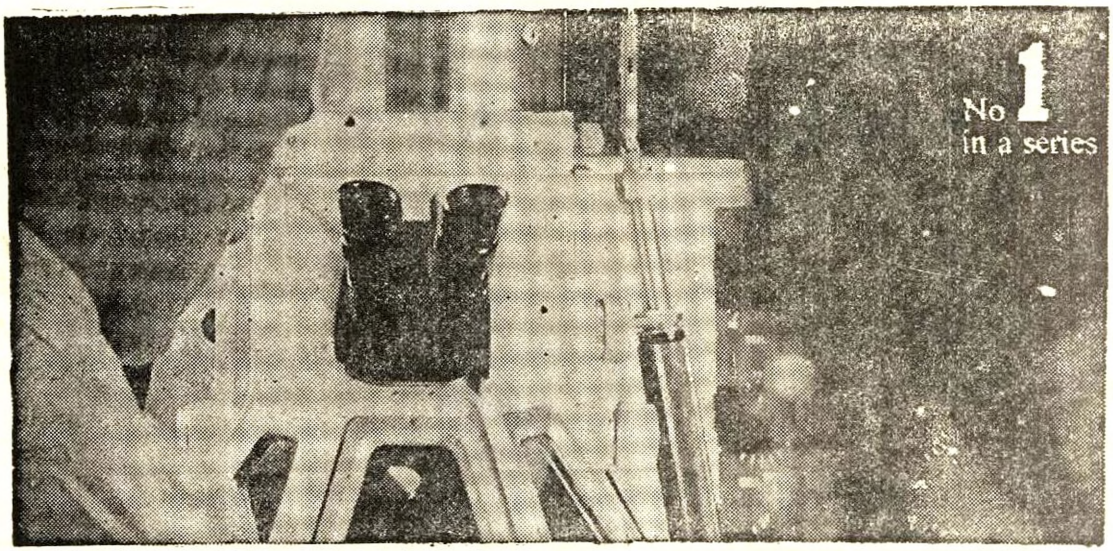
Hony. Secretary:-
L. S. W. DASSANAYAKE
L.D.S. (Ceylon)

Hony. Treasurer:-
M. M. MUKTHAR
L.D.S. (Ceylon)

Members of the Council:-
E. P. FERNANDO
L.D.S. (Ceylon) D.D.P.H. (Syd)

V. CUMARASWAMY
L.D.S. (Ceylon) H.D.D.

K. H T. DE SILVA
L.D.S. (Ceylon) F.D.S.R.C.S. (Glas)



There is more to Pelargon than meets the eye!

In infant feeding, only Pelargon can offer all these advantages

tages

* **Optimum development**
  Pelargon produces physiological phenomena closely resembling those of breast milk.

* **Resistance to infections**
  Thanks to acidification, the high fat and protein ration given by Pelargon is perfectly tolerated and digested, thus conferring a high degree of immunity on the infant.

* **Prevention of rickets & anaemia**
  Acidification allows good utilisation of minerals, particularly calcium and iron — which is ionised and better resorbed in the acid medium.

* **Prevention of gastroenteritis**
  Clinical experience has demonstrated the actual prophylactic properties of acidified milk in the presence of coliform infections.

* **Complete bacteriological safety**
  Not only is Pelargon manufactured according to NESTLÉ processes, which give every guarantee of bacteriological safety, but the development of pathogenic bacteria is impeded in the reconstituted formula which is at a lower pH than other milks. Pelargon therefore does not need terminal sterilisation.

* Wide range of use
  Its perfect tolerance and digestibility allow the use of Pelargon in many cases where the ordinary formulae are poorly tolerated, such as during enteral infections, vomiting, etc.

* Simplicity
  Pelargon contains all the necessary additions of carbohydrates, vitamins and minerals. This, plus complete bacteriological safety, minimises risk of mistakes by the mother.

QUALITY NESTLÉ SECURITY

Avoid feeding problems prescribe Pelargon

Marketed by Ceylon Nutritional Foods Limited

CONTENTS

PYORRHESAN

FOR

PYORRHEA

MANUFACTURED BY

THE PIONEER PHARMACY

PHARMACEUTICAL FACTORY

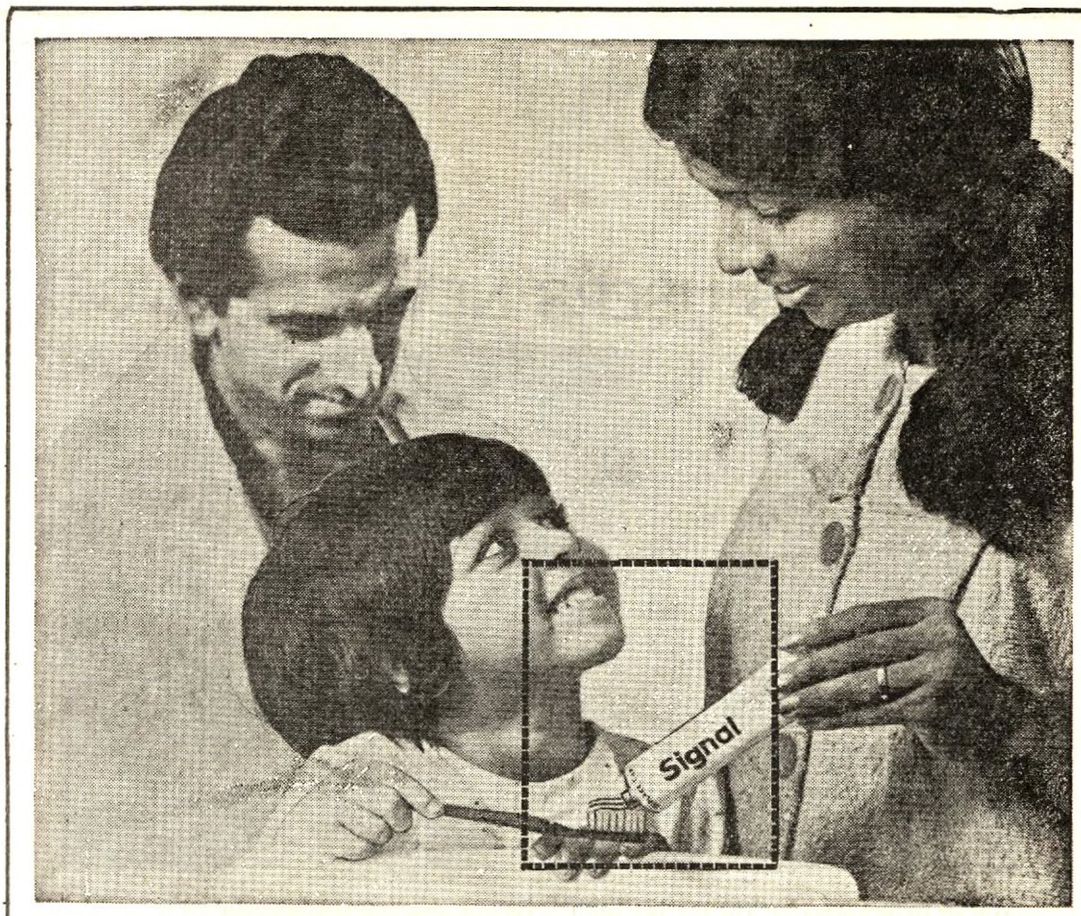
RATMALANA

For your health's sake

BRUSH YOUR TEETH WITH

Merza

Modern Medicinal Tooth Paste



Only Signal has red stripes
which protect your teeth
24 hours a day

SG/5x52

A LEVER PRODUCT

FORHANS USERS NEVER CHANGE

Why do Forhans users say "NO" to other tooth pastes? Because teeth and gums are too precious to take chances with. Forhans users know that it is only Forhans that was formulated by a Dentist to give a life-time of perfect dental care.

Forhans gives them Firm Healthy Gums, and Strong Dazzling Teeth. Forhans flavour is unique, and they simply love it. It does not froth or bubble and wash away the important ingredients in Forhans.

dazzling white teeth and healthy gums are Forhans gifts

The broad spectrum antibiotic of choice

MORITET

(each capsule contains 250 mg. Tetracycline HCl B. P.)

Manufactured by

M. S. J. Industries (Ceylon) Ltd.

&

Distributed by

J. L. Morison Son & Jones (Ceylon) Ltd.

126, ALUTHMAWATTE ROAD,

COLOMBO 15.

Telephone - 31442 - 4

Glaxo

THE NAME
IN THE FOREFRONT
OF
PHARMACEUTICAL
PROGRESS

With Compliments:

GLAXO-ALLENBURYS (CEYLON) LTD.

P. O. BOX 1653, COLOMBO.

COMPETITION FOR A DESIGN OF A SYMBOL FOR INTERNATIONAL DENTISTRY

1. The competition is open to submission of designs by members of member associations of the Federation Dentaire Internationale.

2. A design must be submitted which will have as its motif Dentistry as an international health profession.

3. The design should be in black & white and not more than one other colour and easy to reproduce on note paper, posters, publications, book covers, badges etc.

4. The design must be reasonably simple and have no religious background, i. e. St. Appolonia as a symbol is not acceptable.

5. Six copies or photographs of the design should be submitted to the Executive Director not later than 1st April 1972.

6. The executive Committee of the FDI will select three of the designs when it meets in April 1972, for submission to the General Assembly A when it meets in Mexico City in October 1972.

7. The General Assembly will select the best design and award the prize. This will apply even if the General Assembly does not accept the design.

8. The FDI will hold the copyright on the winning design.

Designs to be mailed to :

Dr. G. H. Leatherman,
Executive Director,
Federation Dentaire Internationale,
64, Wimpole Street,
London, WIM 8AL, U.K.

DOCTOR, RECOGNISE THESE PATIENTS?

ALL ARE SUFFERING FROM MODERATE TO MODERATELY SEVERE PAIN

they can be relieved with

Zactirin* tablets

Ethoheptazine Citrate–75 mg. (A product of original research in the Wyeth Laboratories U.S.A.)
with

Acetylsalicylic Acid — (325 mg)
Calcium Carbonate — (97 mg)

The only non-narcotic *analgesic which provides*

★ effective codeine-like analgesia;
★ safety of a non-narcotic;
★ unique relief of pain

Packings:- In Bots. of 10 and 100

Wyeth International Limited
U. S. A. & U. K.

Sole Agents:

M/S. COLOMBO AGENCIES
No. 7, Alexandra Place, Colombo 7.

*TRADE MARK

CEYLON DENTAL ASSOCIATION

SEMINAR

Held on Sunday 5th December, 1971.

PATHOLOGY LECTURE THEATRE,
FACULTY OF MEDICINE,
KYNSEY ROAD, COLOMBO 8.

PROGRAMME

" Pre Cancerous Lesions of the Oral Cavity "
GUNADASA AMARASEKERA L.D.S. (Cey.)
F.D.S.R.C.S. (Eng.)

K. H. T. DE SILVA L.D.S. (Cey.)
F.D.S.R.C.S. (Glas.)

" Cyst Like Swellings of the Jaw Bones "
V. RAJAYOGESWARAN B.D.S. (Cey.)

" Surgical Orthodontics "
Orthodontic point of view
S. SIVASUBRAMANIUM L.D.S. (Cey.)
Dip. Orth R.C.S. (Eng.)

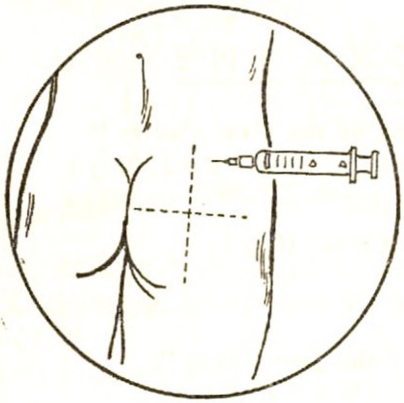
Surgical point of view
V. S. KARUNAGARAN L.D.S. (Cey.)
F.D.S.R.C.S. (Edin.)

" Maxillo - Facial Injuries "
Maxillo-Facial Injuries in Children-
R. GOONATILLEKE B.D.S. (Cey.)

Road Traffic Accidents-
Sri PATHMANATHAN F.D.S.R.C.S. (Eng.)
L.D.S. (Cey.) F.R.C.P., M.R.C.S. (Eng.)

TERRAMYCIN*
SOLUTION IM and IV

INTRAMUSCULAR



AND

INTRAVENOUS

When oral therapy is difficult or undesirable

The only preconstituted broad-spectrum antibiotic convenient and practical for office and house calls

*Trademark of Chas. Pfizer & Co., Inc.

Science for the world's well-being®
Pfizer

CEYLON DENTAL JOURNAL
VOLUME 2

THE CEYLON DENTAL COUNCIL

Self government is a privilege enjoyed by the leading professions and with the establishment of the Ceylon Dental Council, we, the members of the Dental Profession too will be entitled to this privilege. Many years have elapsed since the idea of independence took root and in 1971, we have taken a big step forward towards self government.

The basic functions of the Ceylon Dental Council will be the compilation and publication of a Register of all those who are considered by the profession to be fit to practise dentistry and the maintenance of standards of education and ethics of those admitted to it.

Registration will be based on clearly defined standards of education and skill and will enable the layman to readily distinguish practitioners who have attained these standards from those who have not. The Council will also deal with applications for registration from those qualified in other countries; issue directions for temporary registration to enable professionals from overseas to work for postgraduate diplomas and to allow distinguished visitors to give demonstrations etc; consider applications for the registration of additional diplomas; and remove from the Register those who are considered unfit to remain in it.

In the field of education, the Council will prepare recommendations concerning the undergraduate and postgraduate dental curricula, carry out visitations to the Dental School and visitations of examinations.

In maintaining discipline, the Council will hold inquiries into cases of members who are alleged to have been guilty of grave professional misconduct or who have been convicted of a criminal offence It will also initiate the prosecution of anyone who practises dentistry without being registered.

In addition to these, the Council will have certain Statutory duties in connection with ancillary dental personnel. Approving training programs and making disciplinary arrangements for these workers will be the responsibility of the Council.

The Ceylon Dental Council will have to assist and encourage in every way the development of dental practice in the interests both of the public and the profession. It will control the standards of the professional men for the benefit of their patients.

Members of this highly influential body should be selected with utmost care. Those selected should bring to the deliberations of the Council. a wide experience of dental practice. They should have a realisation of the requirements of the profession and the public, and have an understanding of the duties which they must accept, jealously guarding the ethics and dignity of the profession and exercising discipline with understanding and compassion. They should be men endowed with wisdom, experience, imagination and progressive thought. They will influence the whole of our professional life and determine to a large degree our professional future.

SURGICAL ORTHODONTIC CORRECTION OF ADULT MAXILLARY PROTRUSION

V. S. KARUNAGARAN *L.D.S. (Cey) F.D.S.R.C.S. (Edin)*
Consultant Dental Surgeon Dental Institute Colombo

A large number of adult patients with an essentially healthy dentition submit to multiple extraction of teeth and alveolectomy to correct marked protrusion of anterior teeth. They are pleased with their new dentures but would be happier if it was possible to push the anterior segment back and keep their natural teeth.

The patients who fall into this category include those who could not have the benefit of orthodontics when they were young for various reasons, and those who have a severe skeletal class II division I malocclusion.

In the adult patient this occlusal abnormality is difficult and is often impossible to correct by orthodontic procedure. If orthodontics is undertaken the time taken often is considerable and the end result may be less than ideal. Moreover these patients will invariably require fixed appliances if any good is to result.

Orthodontic Surgery introduced quite recently offers a solution to these problems. However, surgical procedure is neither an alternative to orthodontics nor a means of instant orthodontics.

Certain orthodontic limitations and dento facial characteristics of class II malocclusion in adults may be indications for surgery.

1. Cessation of jaw growth and development.
2. Unwillingness of the patient to wear orthodontic applicance for necessary period of time.
3. Skeletal deformity too great for orthodontic correction.
4. Excessive maxillary gingiva exposed when the patient smiles.
5. Orthodontic intrusion of teeth is difficult.
6. Prolonged orthodontic treatment Contraindicated by periodontal condition.
7. Missing posterior dentition which would normally serve as anchorage teeth.
8. Socio economic consideration.

(William H. Bell)

Orthodontic consultation is necessary before a decision to do surgery is taken. It may be necessary for orthodontic treatment to precede surgery.

The most appropriate Surgical treatment plan is then evolved by clinical evaluation along with clinical photographs, radiographs and dental study models.

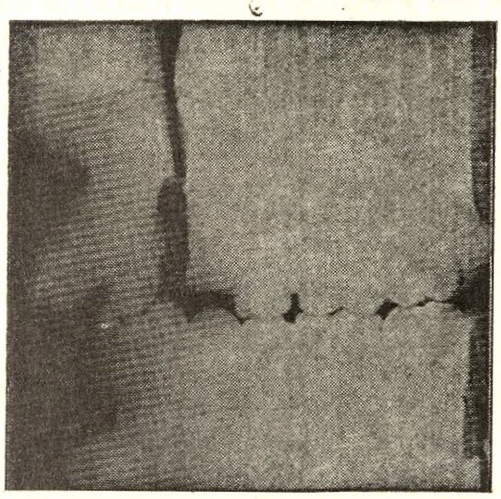
Model Analysis

Original models are permanently mounted in the present centric occulsion and kept for reference.

Articulated study models are prepared, the position of individual teeth, the angulation and occlusion are carefully studied. Study of articulated models gives a clear picture of the discrepancy between the maxillary and manibular arches, open bites and other occlusal abnormalities.

The "operation' is now performed on the models. (fig. 1 & 2) By sectioning several models at various sites and assembling in the most desirable occlusion the best of operative cut is determined. This will also show any obstruction by the lower teeth, which prevents the anterior segment from being moved into the desired position. Usually this is a problem and can often be overcome by grinding down lower incisors. or using an orthodontic applicance to depress the lower incisors. Sometimes it becomes necessary to reposition the mandibular anterior segment surgically.

It will also help to ascertain whether the anterior segment has to be bodily pushed back or it requires tilting or both, and whether the segment has to be raised or lowered. It may be necessary to section several models before deciding on the final position.



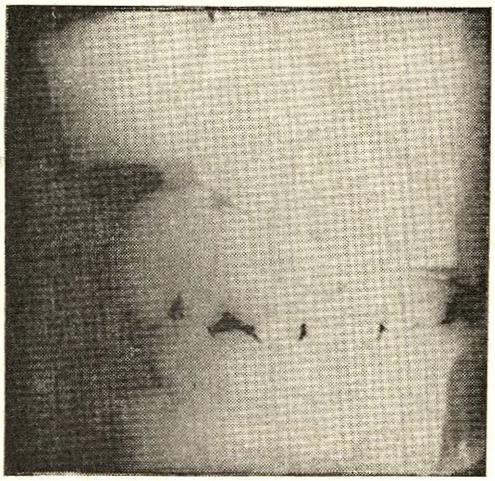


Fig. 1 Sectioned study models before and after re-positioning. *Fig. 2*

Splint

An interocclusal acrylic **splint** is constructed on the final "operated" models. This will serve as a template to position the anterior segment into position at operation. It can also be used as a splint and ligated to the arch bars or to eyelets.

Photographic Evaluation

Photographs are imperative as pre operative records. For purpose of diagnostic evaluation, it should be available at the time of model analysis. It helps in the study of soft tissue profile contour, lipline, and asymetry, chin eminence etc.

Clinical and Radiographic Evaluation

Full-mouth intra oral radiographs are necessary to eliminate any peri-apical dental pathology and periodontal disease.

Cephalometric lateral skull radiographs are essential for evaluation of skeletal pattern. The theoretical scientific way to determine whether there is maxillary protrusion or mandibular retrusion, or both are present, is by cephalometric analysis. Cephalometric x'rays were done by a modified technique without the use of a cephalostat (Karunagaran & Somapala). However, these results were not made use of as there is no published normal values for the Ceylonese race for comparison.

The patient is made to posture the mandible forward to 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 effect 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.

Surgical Procedure

Surgery is performed under naso endotracheal anaesthesia. The push back operation can be done in one stage or in two stages. One stage operation has been found to be biologically sound as proved by animal experiments and the numerous operations performed and reported. I have done a number of one stage operations without any complications subsequent to surgery. Strict asepsis, good assistance, an autoclavable high speed drill like the Hall Air drill are very essential.

Various techniques have been used for maxillary osteotomy. The following method was used by me most frequently.

Fig. 3

Palatal flap is raised & bone removed by a tunnelling process. Note split arch bars.

Stage I

Palatal incision is made along the gingival margin extending from the incisal papilla to the second molar region. Using a suitable periosteal elevator a flap is raised by a tunnelling process up to the midline of the palate. (fig. 3) The chosen tooth, usually the first premolor is extracted. A palatal bone cut is made extending from the extraction socket towards the midline of the palate. The amount of bone removed and the direction of bone cut are as predetermined by the study models.

The process is repeated on the opposite side and the bone cuts are joined. If necessary a vertical midline incision of the flap can be made to facilitate the bone cuts.

Even though a certain amount of tunnelling process is involved bone cutting should be under direct vision. Saline irrigation throughout the process is essential to prevent bone necrosis. Flaps are sutured using 3 / 0 black braided silk. I usually use an acrylic plate to support the palatal flaps.

Procedure takes less than half an hour. Antibiotic is administered for five days. Patient can be discharged from the hospital in 24 hours.

Stage II

The second stage is done after an interval of two weeks. A vertical incision is made buccal to the extraction socket, which curves forward over the apex of the canine root. The incised margins are raised using a periosteal elevator and extended forward and upward to expose the pyriform fossa. An instrument is placed in the fossa and the flaps are retracted. Predetermined amount of bone is removed extending from the extraction socket to the pyriform fossa. (fig 4) Care is taken to skirt above the apex of the canine roots. A blunt probe is

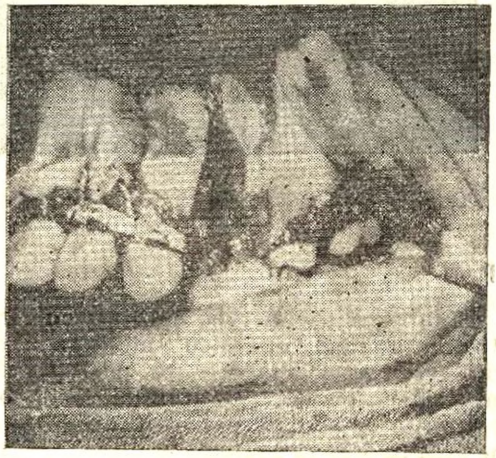


Fig 4

Instrument is placed nasal fossa and pre determined amount of bone is removed.

used to check that the labial cut joins the palatal cut and there are no bony spurs in the gap.

The process is repeated on the opposite side.

Now a vertical incision is made in the labial sulcus over the nasal spine and nasal septum is exposed, using a small osteotome the septum is divided from the Vomerine attachment. (Fig. 5) At this stage the anterior maxillary segment will be free.

A previously prepared inter occlusal acrylic splint is seated on the molar teeth and the anterior fragment is keyed into position. Erich arch bars are ligated to the upper arch with the maxillary fragment in the desired position. (Fig. 6) If split arch bars have been previously applied then they are joined together at either end. The splint may be left in situ ligated to the arch bars.

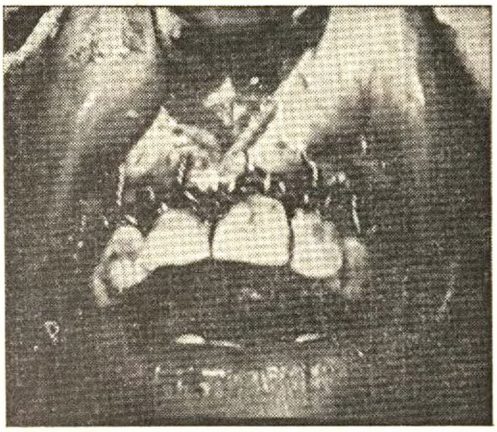


Fig. 5

Nasal spine is exposed and anterior pre-maxillary segmant is freed with an osteotome.

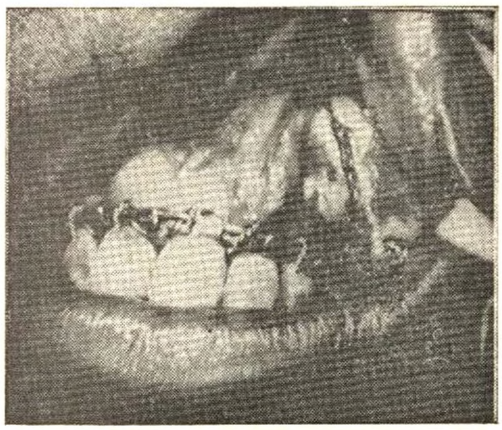


Fig. 6

Post-reduction position showing satisfactory apposition.

Patient is given antibiotics usually pencillin for five days and chymoral for three to five days to control oedema'. The Acrylic splint is removed in about a weeks time and the arch bars left for six weeks.

After the removal of the arch bar an impression is taken and a Hawleys retainer made which the patient uses for about two to three months.

Case Reports

Two cases are presented.

Case I

A 21 year old girl educated, well groomed attended my clinic for consultation, regarding her projecting maxillary incisor teeth. Her main complaint was that she showed too much labial gingiva when smiling. (fig 7)

Clinical examination, radiographic photographic evaluation and model analysis, showed a severe skeletal Class II division I malocclusion, a prominent over jet with spacing in between the incisors. (Fig 8) A certain amount of proclination and a deep over-bite with the lower incisors almost impinging on the palatal mucosa.

The upper lip was short and imcompetent. The lower lip was tucked behind the upper incisors.

Study of articulated models and "operation" done on the plaster models showed that satisfactory occulsion may be obtained by extracting the two first premolars and bodily pushing back the anterior segment, raising the segment by about 3–4 mm and slightly tilting the incisors inwards. It was also found that the lower incisors had to be depressed. It was decided to grind down the incisors to the required amount of about 2 mm. to get a satisfactory incisal relationship and to get a stable position for the upper segment This was done on the models An inter occlusal arcylic splint was constructed on the "operated" models.

Surgery was done in February 1970 in two stages.

After the extraction of the first premolars pre-determined amount of palatal bone was removed by a tunnelling process. A plate was used to support the palatal flap.

Buccal muco-periosteal flap was raised as described earlier and predetermined amount of bone was removed Vomerine attachment was freed with an osteotome. Continuous arch bar was applied after setting the fragment using the acrylic splint as template. Post operative appearance is shown in figs. 9 & 10.

Chymoral and antibiotics were administered.

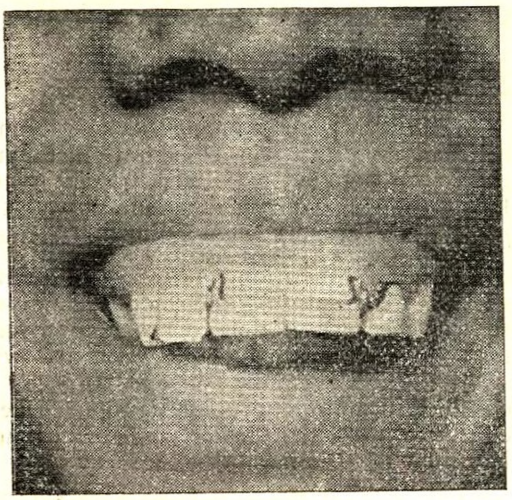


Fig. 7
Case I Excessive maxillary gingiva exposed when patient smiles.

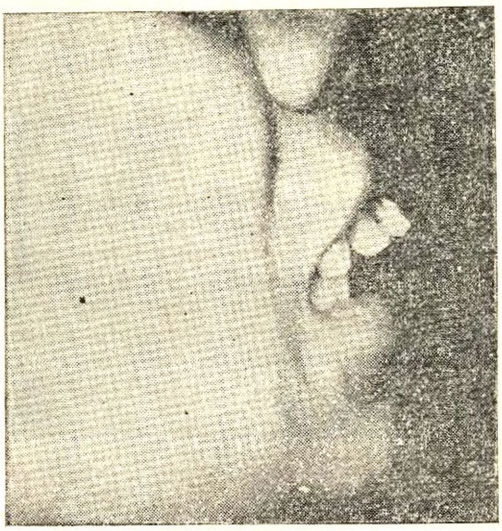


Fig 8
Case I Maxillary protrusion before operation.

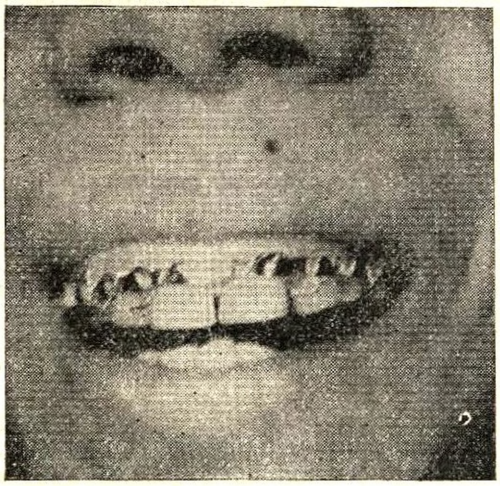


Fig. 9
Case I post operative occlusal relationship Erich arch bars in situ

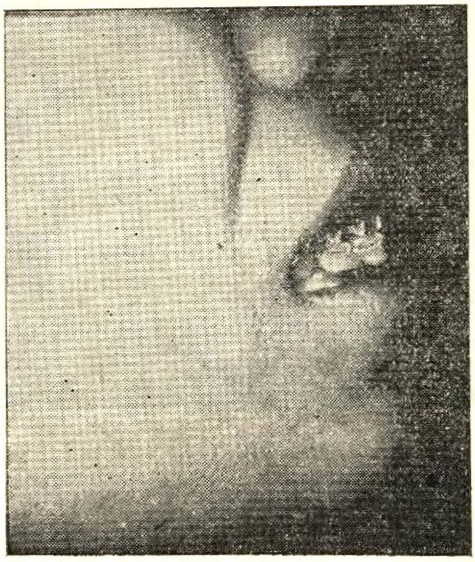


Fig. 10

Arch bars were removed in six weeks and Hawley retainer given which the patient used day and night for three months and only in the night for the next three months.

Vitality tests for the incisors were negative for first three months. One year later all teeth responded to vitality test. No discolouration of teeth was noticed. Spacing though not completely closed showed no relapse. The upper incisors were now in a stable position under the lower lip, although there was a residual over jet.

Case II

This case illustrates correction of an anterior open bite in a class II division I malocclusion on a skeletal base. (Fig. 11 & 12)

Fig. 11

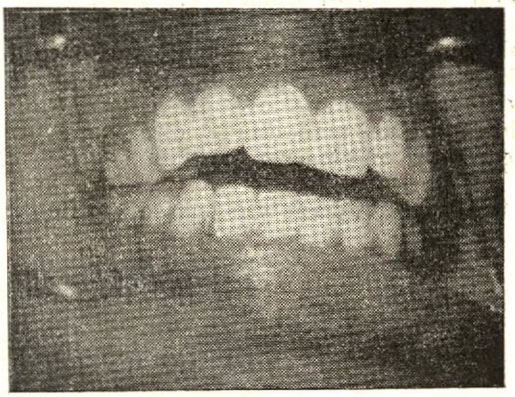


Fig. 12

Case II Skeletal class II Division I malocclusion with anterior open bite

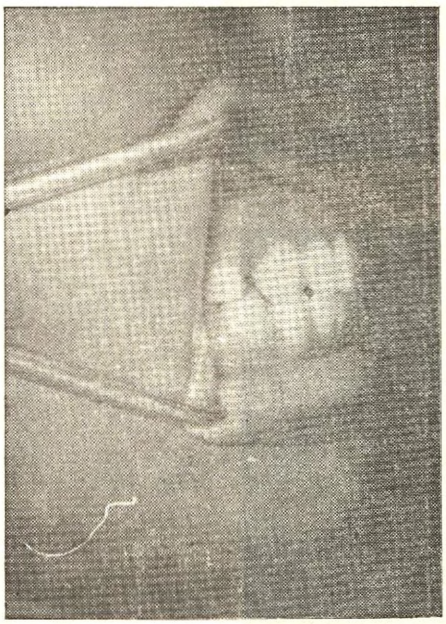


Fig. 13

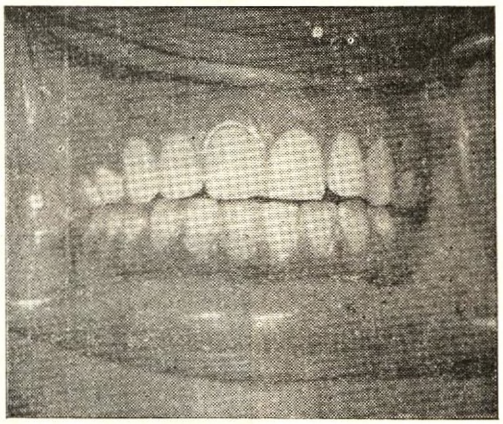


Fig. 14

Caset II Post operative occlusal relationship.

A 24 year old girl working as secretary to an executive wanted her protruding teeth adjusted.

She presented with all carious teeth attended and excellent oral Hygiene

She had a mandibular postural habit which masked the severity of her deformity. Lips were parted, appeared as if she was smiling with her teeth apart the whole time. On examination it was noted that lips were incompetent, upper incisal line was high

with an anterior open bite. She showed a lot of gingiva when she smiled. She had an obvious tongue thrust. The tongue occupies the space between the upper and lower incisor teeth when swallowing. The severity of the maxillo - mandibular discrepancy was seen only on closer examination. (fig. 12)

Radiographic analysis, photographic evaluation and model analysis, revealed that the anterior open bite could be corrected and overjet reduced by extracting the first premolars, and pushing back the anterior segment. It was also noted that there would be a residual space in the premolar region. The open bite could be reduced to an edge to edge bite.

Fig. 15

Fig. 16

Case II Clinical profile of patient before operation (upper) and after operation lower)

Same operative procedure was followed for this as well.

Supporting plate was given after the first step. Continuous arch bar was ligated to the teeth and interocclusal splint was ligated to the arch bar. It was noticed that the anterior segment was not quite keyed into position in the splint. This was achieved subsequently by using rubber bands after splitting the arch bar in the canine premolar region on one side. Once the desired position was reached the arch bars were joined by ligature wire.

The splint was in position for one week The arch bar was removed in six weeks, and a Hawley retainer given. This was used by the patient for five months. Figures 15 and 16 show pre and post operative profiles.

Post Operative Review

Patient was reviewed 17 months after the operation. Occulsion was satisfactory. Study models were made in October '71 and compared with the models made in July 1970. In view of the fact that this patient had a tongue thrust habit and no bone graft was placed into the space created by the downward displacement of the maxillary segment at the time of operation, some changes were expected, but there was no evidence of relapse.

References.

Bell W H. et al — Surgical Orthodontic correction of class II malocclusion. Journal of Oral Surgery April 1968.

Bell W. H. — Revascularization and bone healing after anterior maxillary osteotomy: A study in adult monkeys. Journal of Oral Surgery March 1970.

Bell W. H. — Journal of Oral Surgery August 1970.

Cradock H. et al — The Surgical repostioning of labial segments in the treatment of malocculusion. The Dental Practitioner May 1968.

Lund B. A. et al — Surgical Orthodontic Correction of Maxillary protrusion. Mayo clinic proceedings March 1968

AUTO IMMUNITY & ORAL DISEASE.

N. A. de S. AMARATUNGA, *F. D. S. R. C. S. (Edin.)*

The Medical world has entered a new era "The era of Auto Immunity". In the recent past Medical Scientists have tried to explain the aetiology of many obscure affections by way of Auto Immunity and have met with considerable success. Few years ago Lehener achieved a major break-through in the quest for aetiological factors of certain oral diseases thus making Auto-Immunity a subject of interest to the Dental Surgeon as well.

Immunity is defined as the body's ability to produce antibodies against foreign matter (antigen) the ultimate result being the elemination of the injurious foreign substance. Immunity is a normal physiological phenomenon and is essential for the defence mechanism. On the other hand auto-immunity is not normal in that antibodies are produced against proteins and other substances that belong to the organism itself.

Mechanism of Immunity and Auto Immunity :—

Normally the body's defence mechanism retains the ability to recognise foreign proteins and also to effect the elemination of such substances. Plasma cells and lymphocytes are said to be the cells concerned with the identification of "foreign" proteins and the subsequent production of the antibodies. The exact mechanism and the respective functions of the individual cells is still a controversy. These cells are known as "Immunologically Competent cells"

Under abnormal circumstances this same defence mechanism erroneously may recognise "self" proteins as "foreign" proteins. The subsequent distruction of these substances essential for normal physiological functions, could lead to the establishment of a pathological condition.

For example if the constituent proteins of the oral mucosa are read as "foreign" the distruction of these proteins could produce an ulcer.

Identification of "self" proteins as foreign could occur under two different conditions;

(1) It may be due to a break-down in the immunological mechanism itself, rendering it incapable of recognizing certain "self" proteins.

(2) Or it may be due to some change in the "self" protein which makes it "foreign" as far as the immunological system is concerned.

The former mechanism is said to operate in conditions like Rheumatoid Arthritis and the latter in conditions such as Aphthous Ulceration and Pemphigus.

Antibodies formed against self proteins are called auto-antibodies.

Features of Auto-Immune diseases:-

Lehener describes the following features as common to Auto-Immune diseases ;

(1) A raised plasma-globulin level. This is as expected for antibodies which are proteins belonging to the globulin fraction.

(2) Infiltration of the affected tissues by lymphocytes, the cells concerned with antibody formation.

(3) Deposition of abnormal proteins in the organs affected. These proteins are supposed to be the by product of the antibody-antigen reaction.

(4) Occurs in association with other auto-immune diseases.

(5) Favourable response to treatment with Cortico-Steroids. Certico Steroids suppress the formation of antibodies.

Types of Auto-Immune diseases :-

Three main types are recognised. This classification is based on the type of auto-antibody formed.

(1) Organ specific type.

Here the auto-antibodies are formed against a specific protein found in a specific organ. The lesion is limited to the affected organ but secondary manifestations may be seen elsewhere. Examples are;

(a) Addisons disease (b) Pernicious Anaemia (c) Primary Thrombocytopenic purpura

(2) Non-Organ specific Type.

More than one organ is affected probably because the antigen (the "self" protein against which the antibody is produced) is found in all these organs. Examples are; (a) Rheumatoid Arthritis (b) Pemphigus.

(3) Mixed Type.

More than one auto-antibody is produced, some of which are organ specific while others are non-organ specific. Examples are; (a) Sjogran's Syndrome (b) Lupus Erythematosus.

Auto-Immune Diseases of the oral cavity:-

The oral cavity may be directly or indirectly affected. Conditions in which it is directly affected are;

1. Aphthous Ulceration
2. Pemphigus
3. Pemphigoid
4. Sjogran's Syndrome
5. Lupus Erythematosus

Those in which it is indirectly affected are;

1. Pernicious Anaemia
2. Rheumatoid Arthritis
3. Primary Thrombocytopenic Purpura
4. Addison's disease
5. Myasthenia Gravis.

Let us consider some of these conditions in detail.

1. Aphthous ulceration:—

Until recently the aetiology of Aphthous ulcers was unknown. Few years ago Lehener using highly sensitive techniques was able to discover auto-antibodies in people affected with Aphthoe. These were formed against "self" proteins in the oral mucosa. He also noticed a morphological change in the lymphocytes at the time the ulcers made their appearance (This change is now made use of as a confirmatory test in the diagnosis of a number of auto immune diseases - the Test is known as Lymphocytic Transformation test.)

Kramer describes three types of Aphthoe based on the degree of tissue damage.—

(a) Minor Aphthoe

(b) Major Aphthoe (or Periadinitis mucosa necrotica recurrence)

(c) Aphthous ulcerations with involvement of other mucous membranes, skin, and other organs
eg; Bechets Syndrome; Stevens Johnson's Syndrome, Reiters Syndrome.

It was mentioned earlier that an alteration in the mucous membrane proteins could cause the formation of auto antibodies. It is thought that this alteration could be brought about by repeated trauma of any form; physical chemical or biological. Another possibility is that bacterial proteins may act as haptens and thereby induce the formation of auto antibodies.

(a) Minor Aphthoe:—

Patient may or may not experience a burning sensation in the mucous membrane prior to the appearance of the ulcers. Small round ulcers 4 20 in number appear in non-keratinized areas and the patient complains of very severe pain of a burning nature. Ulcers heal in about seven days without leaving scars. After a latent period these ulcers appear in crops again.

(b) Major Aphthoe:—

Kramer believes that this condition is merely a more extensive and deep seated variety of the former and descriptive terms like Periadinitis Mucosa Nectrotica Recurrence should not mean that it is a seperate entity.

A small indurated nodule breaks down to form a deep irregular crateriform painful ulcer usually 1 - 4 in number. These

ulcers take a longer time to heal usually about two weeks and also leave scars because the tissue damage is more extensive.

(c) Apthous Ulceration with involvement of Skin:—

In Bechets and Steven's Johnson's Syndrome there is involvement of the conjunctiva, the urethral mucosa and other mucous membranes giving rise to conjuncitivitis urethritis etc. In Reiters syndrome joints are also affected with a Rheumatoid type of arthritis.

2. Pemphigus:—

In pemphigus both the mucous membrane and the skin are affected. The condition is characterised by flaccid bullae which break down to form ulcers. Most important diagnostic feature is the absence of an inflammatory reaction around the bullae.

Here the auto-antibodies are formed against the cementing substance of the epithelial cells. Destruc ion of the cementing substance leads to the detachment of these cells and the formation of bullae.

Pemphigus was at one time invariably fatal but now the survival rate has markedly improved with the use of Cortico-Steroids.

3. Pemphigoid:—

Pemphigoid is another bullous lesion which affect the oral mucosa and the skin. Unlike pemphigus this is a more chronic condition and life is never in danger. The patient experiences little difficulty except in cases where the pharynx, oesophagus and conjunctiva are involved with the formation of strictures. The patient may not tolerate dentures.

In Pemphigoid the antigenic material is believed to be the basement membrane the dissolution of which is responsible for the formation of bullae. These bullae usually break down to form ulcers.

4. Sjogran's Syndrome:—

Originally known as Mickulicz's disease, this syndrome is a symptom complex consisting of (1) Dry mouth (2) Enlargement of salivary glands and (3) Rheumatoid Arthritis. Though these were not the same symptoms described by Mickulicz, later it was found that the histo-pathological picture of the enlarged salivary glands was the same in both. Concurrent presence of Rheumatoid Arthritis in some of the cases diagnosed as Mickulicz's disease made it clear that Mickulicz's disease and Sjorgran's syndrome were one and the same.

More than one auto-antibody is present, some of them being organ specific while others are non-organ specific. The most commonly found auto-antibodies are the anti-nuclear antibodies which act against the parenchymal cells of the salivary glands and the Rheumatoid Arthritis factor (the antibody which causes Rheumatoid Arthritis in these patients).

There is gradual destruction of glandular tissue. The mouth is dry due to lack of salivary secretion and the patient will experience immense discomfort. Denture tolerance is very poor under these circumstances. Later the mucous membrane may become cracked and ulcerated. Salivary glands may show enlargement.

Lupus Erythematosus:—

This is a very rare condition. Two forms are recognized;

(1) Discoid Lupus Erythematosus and
(2) Disseminated Lupus Erythematosus.

The oral mucosa may be affected in both these forms.

Auto-antibodies are antinuclear. In the Disseminated type several antibodies may be detected.

The lesion seen in the oral cavity is a whitish patch with reddish margins and red streaks radiating outwards. Diagnosis is difficult without biopsy.

In the discoid type the lesion is confined to one site. In the Disseminated type the lesion is wide spread: heart and kidneys are also involved. The confirmatory special test known as the L. E. Phenomenon is positive only in the case of the disseminated type. The patient usually dies of kidney or heart failure.

Auto-Immune Diseases with indirect affect on the oral cavity:—

Pernicious Anaemia:—

Oral manifestations of Pernicious Anaemia are well known. The filliform papillae and then the fungiform papillae gradually atrophy leaving a smooth shining painful tongue (Glossodynia -- Hunter's Glossitis, or Moeller's Glossitis). Patient may complain of burning sensation of the mouth. Angular cheilitis is a common feature in these patients. There is paleness of the mucous membrane due to the anaemia.

Pernicious Anaemia is caused by a lack of absorption of Vitamin B 12 essential for the maturation of red cells. For the absorption of Vitamin B12 a factor known as the Intrinsic Factor secreted by certain glands in the stomach has to be present. In Pernicious Anaemia it is believed that auto-antibodies bring about a gradual destruction of these glands. Lack of the Intrinsic Factor results in the lack of absorption of Vitamin B12. Red cells fail to mature and they are quickly distroyed by the Reticulo Endothelial system.

Rheumatoid Arthritis:—

The Tempero Mandibular Joint is rarely affected. In the Marie-Strumpell variety the incidence of T/M joint involvement is said to be high.

The auto-antibody found is the R. A. factor also found in Sjogran's Syndrome. It acts against the proteins in the synovial membrane of the joints provoking a chronic inflamatory reaction.

When affected the patient experiences pain on movement, clicking noises and later limitation of movements. Ankylosis is a common complication.

Primary Thrombocytopenic Purpura:—

Aetiology of this condition was quite unknown until the concept of auto-immunity came into being, Antigen is believed to lie in the cells responsible for the formation of platelets.

The patient may complain of bleeding which could be sudden in onset and alarming to the patient -- patient suddenly finding his mouth full of blood. Petechial haemorrhage may be seen in the palate, tongue and other areas.

When treating these patients one has to take precautions against excessive bleeding. A short course of Cortico-Steroid therapy may improve haemostasis to a remarkable degree. This is in keeping with the fact that auto-immune disease respond favourably to steroid therapy.

Addison's Disease.

Addison's disease is caused by a reduction in the secretion of Cortico-Steroids by the Adrenal Cortex. Anti-nuclear anti-bodies are said to be in action bringing about the destruction of secretary tissues of the Adrenal Cortex.

Dark brown pigmentation of the oral mucosa draws attention to the possibility of underlying pathology.

When the body is under any form of stress as during surgical procedures or following injury, the Adrenal cortex is called upon to secrete more steroids. In the patient having Addison's Disease, the adrenal cortex will not be able to meet this demand, and the patient may pass into an Addisonian crisis. Hence the need for precautionary measures in these patients prior to surgery or in the instance of injury.

Myasthenia Gravis.

This is a very rare condition which causes muscular weakness incapacitating the patient to a very great extent.

Muscular weakness can cause inability to masticate food and also inability to carry out self cleansing movements and other excursions of the tongue, cheeks and floor of the mouth, resulting in malnutrition, poor oral hygiene, caries and periodontal disease.

Diagnosis of Auto-Immune Disease:—

Bacterial infection is diagnosed by the application of Koch's postulates. Lehener introduced a more or less similar method for the diagnosis of Auto-Immune disease.

The similar requirements for confirmation of diagnosis of Auto–Immune diseases are

(1) Presence of an antigen.
(2) Presence and identification of an auto-antibody.
(3) Introduction of the antigen into an experimental animal induces the formation of an antibody.
(4) Passive transference of the disease is affected by the introduction of the auto-antibody, into an experimental animal.

Detection of auto-antibodies and their titre measurements involve highly sophisticated techniques. One such technique is the Auto-Antibody Florescence Technique used by Lehener in his investigations. Lymphocytic Transformation Test mentioned earlier is another.

The ordinary practitioner has no facilities to conduct such investigations which are only confirmatory. He should base his diagnosis on clinical features and simple investigations like biopsy. For details in histopathology of these conditions the reader is referred to appropriate texts.

Treatment of Auto-Immune disease:—

It was mentioned earlier that the favourable response shown by Auto-Immune disease to Cortico-Steroid therapy is a common feature but it has been noticed that while some conditions respond remarkably well others do not. This is inexplicable as one of the actions of Cortico Steroids is suppression of antibody formation and one expects them to have an equal effect on all Auto-Immune diseases.

In conditions like Pemphigus and Disseminated Lupus Erythematosus Cortico-Steroids have proved to be life saving.

Local applications of various preparations containing steroids was seen to be quite effective in the treatment of Aphthous Ulcers.

Steroids have not been equally effective in the treatment of Sjogran's syndrome. Neither in Pernicious Anaemia and Myasthenia Gravis.

Treatment of Sjorgn's syndrome still remains symptomatic Xerostomia (dry mouth) could be controlled to a certain extent by rinsing the mouth with a solution of Methyl Cellulose or glycerol. Salivary secretion could be stimulated with lime juice and other drugs. Particular attention has to be paid to oral hygiene and control of caries.

Cortico-steroid therapy is the treatment of choice for Addison's Disease as it corrects the steroid deficiency as well. Establishment of a higher blood steroid level prior to surgery, prevents Addisonian crisis.

As mentioned earlier Primary Thrombocytopenic Purpura responds favourrbly to steroid therapy. Whenever surgery is indicated it is good prudence to start with a course of Cartico - Steroids in order to minimise bleeding.

Pernicious Anaemia is treated with Vitamin B 12 administered systemically thus bypassing the absorption mechanism in the gut.

Conclusion:—

The concept of Auto-Immunity has thrown much light on many otherwise obscure diseases. Does Auto-Immunity play a role in such physiological processes as ageing? Will it have a place in the control of pathological processes like maliganancy? Workers now believe that these are some of the possibilities

Yet as in the case of investigations into any new concept here too, many factors remain unexplained. How and why does the immunological mechanism breakdown? What brings about the change in " self " proteins that make them foreign? These are some of the questions still unanswered. Hypotheses many and varied have been put forward and it is a matter of time when scientific proof will be available.

Reference:—

T. Lehener — *Journal of Dermatalogy May 1970.*

I. V. H. Kramer — *Australian Dental Journal August 1968.*

B. E. D. Cook — *Annals of Royal College of Surgeons of Edinburgh March 1969.*

THE PATHO GENESIS OF ODONTOGENIC CYSTS IN JAWS

V. RAJAYOGESWARAN. *B. D. S. (Cey.) Dental Surgeon, G. H. Kandy.*

The word cyst, derived from the Greek - Kustis – a bladder, means a pathological fluid filled sac lined by epithelium. A few cysts may not have an epithelial lining. The cysts are the commonest cause of swellings of the jaws. They are commoner in the jaws than other bones because many rests of epithelium remain in the tissues. Cysts formed from epithelium which is related in some way to tooth formation are known as odontogenic cysts. The developing structures other than the teeth may also have remnants of epithelium in the tissues after development is complete. This is especially common in the region of the face because of the many embryonic processes which fuse together to form its structures and these epithelial remnants give rise to non odontogenic cyst (fissural cysts) The cysts of jaws had been of great interest to the oral pathologist and clinician.

Historically in 1654 Scultetus was the first to describe the Cystic swellings of jaws. In 1728 Fauchard suggested that the cystic swellings were connected with teeth. John Hunter in 1774 published a monograph on patho – anatomic study of teeth. He considered the cysts arising from teeth to be the consequence of the dreadful phenomenon of Dental Caries.

Jourdain in 1778 had described cases which appear to be Dentigerous cysts. But it was Paget who had introduced the term " Dentigerous Cyst " in 1853.

In 1885 Malassez who fully described the odontogenic epithelial rest cells which had been associated with root formation, had also intimated that they could be associated with cyst formation.

A. W. Baker in 1891 wrote up a monograph on the pathology of cysts arising from odontogenic tissues and used the term Dentigerous cysts to illustrate all types of odontogenic cysts. Further pathological discussion on these cysts were by Partsch in 1892, who became famous for his rational approach in the treatment of these cysts by permanent decompression.

J. G. Turner showed that the granuloma associated with roots of pulpless teeth, had high incidence of initiating the epithelial cells to proliferate. He termed them "Epithelial root tumours". These are the immediate predecessors of what we now call apical or dental cysts.

Warwick James and Counsell in 1926 did a detailed study of the Nature of epithelium lining the cyst and its origin.

Hill in 1930 published the histological investigations carried out on apical cysts

The experimental investigations and studies in histology, histochemical analysis of cyst lining and contents and the measurements on hydro-static pressure of fluids in the cyst had been studied by recent authors like Thoma, Rushton, Lucas, Toller, Shear, Pindborg, Kramer Tencate and many others.

Knight and Manley in 1955 had shown that the odontogenic epithelial cell lining the cysts possessed proliferating power and tumour potentialities. Their histological studies have revealed, how the multiple cysts form from such epithelial sprouts given off from the epithelial linings of cysts, and also the development of ameloblastomas from these cysts and even odontomas.

Keratin had been found in a variety of odontogenic cysts. Pindborg and Hansen 1964 used the term "Keratocysts" to describe this entity. These workers are of opinion that this type of cysts show strong tendency to recur.

Sonesson in 1950 used roentgenological study on cysts to illustrate the nature and extent of lesions in bone and their relation to important structures.

Classification of cysts in Jaws.

Various classifications have been suggested. Of these, the British Dental Association Committee on odontomas published a report as far back as 1914, after an academic survey of classification of Benigh Cystic lesions of the Jaws.

The first modern and precise system was devised by Robinson in 1945. The classification of these cysts was sub-divided into two specific groups based on the initial source of the epithelial tissues.

Thoma and Goldman adopted Robinson's classification with minor modification in 1960. Kruger in 1964 included a number of cysts of soft tissues of the oral cavity in addition to the Bone cysts of Jaws in his classification. A British author Seward in 1964 classified the cysts with epithelial lining into one group and the cysts without epithelial lining into another group in which he included Traumatic Bone cysts and stromal cysts in Neoplasm. In the same year Lucas based his classification on the supposed aetiology of each cyst and the elements from which it is presumed to have had its genesis.

A simple classification of odontogenic cysts, with the View to illustrate them is grouped as follows by the author–

Group A Periodontal or inflammatory cysts.

1. Apical cyst (Radicular cyst)
2. Lateral cyst (Periodontal cyst)
3. Residual cyst.

Group B Developmental (follicular cyst)

1. Primordial cyst
2. Dentigerous cyst
3. Eruption cyst

Group C Multiple cyst

Group A – Periodontal or Inflammatory Cysts

These are also known as radicular, Dento - Alveolar, Dento - periosteal, Apical or root - end cysts and are closed, epithelium lined sacs formed in the periodontal membrane and adjacent structures, usually at the apex of a tooth, but sometimes along the lateral root surface. They derive their epithelium from remnants of the Sheath of Hertwig. All periodontal cysts are considered to be the result of infection: thus they are also called Inflammatory Cysts.

Apical Cyst (Radicular)

This develops from a chronic proliferative inflammation, the dental granuloma, which contains epithelium that lines the lumen. They form around the apex of a root and gradually increase in size. In the Maxilla they may even encroach on the sinus or nose. In the Mandible they may develop in an anterior and posterior direction in the sub apical area.

Lateral Cyst (Periodontal)

These arise from an accessory root or lateral root canal or from a Periodontal abscess containing epithelial cell rests.

Residual cyst-

This grows from an apical cyst or lateral cyst or a granuloma left behind following extraction of the broken down septic tooth.

Group B – Developmental or Follicular Cysts

These are derived from the enamel organ of the developing tooth and may be formed at different stages of development giving rise to the following varieties.

1. Primordial Cysts.

This term denotes the simplest and the most undeveloped tumour, the primordium being the earliest discernible appearance of an organ. Thus by definition, a primordial cyst of the jaws may be derived directly from undifferentiated dental lamina Shears explained that these cyst arise as a result of degeneration of Stellate reticulum of the enamel organ prior to laying down of calcified tissues. They may occur in place of a normal tooth or arise in a supernumerary epithelial sprout. It has been found to occur in the Gubernacular region too. Cysts may be single or multiple. These form probably about 10% of all epithelial lined cysts of the Jaw.

2. Dentigerous Cysts

These are epithelial lined sacs formed about the crowns of unerupted impacted or ectopic teeth or denticles. There are 2 types: the central cysts and lateral cysts. The crowns of these teeth show normal forms and complete calcification.

3. Eruption Cysts.

These are extra alveolar follicular cysts. The formation of these cysts takes place outside the alveolar bone prior to eruption. The lesion is often regarded as a dilatation of the follicle around a buried tooth in which intra epithelial cleavage occurs, part of the epithelium remaining on the tooth, and the other part being carried away from it by fluid accumulation on to the oral mucosa. This is common in children Treatment - Marsupialization to allow the tooth to erupt into the arch.

Group C . Multiple Cysts.

Developing from adjacent units, they may be of apical or Dentigerous types. The loculi may coalesce or remain separate. If they coalesce, the bone between them is resorbed, leaving only a fibrous tissue partition.

Nature of Cyst Formation

For many years there has been considerable discussion as to whether an epithelial cyst occurs first as a connective tissue cavity which becomes secondarily lined by epithelium or whether the lesion arises as a primary intra epithelial break down.

Counsell (1932) suggested that chronic apical abscesses may sometimes become lined with epithelium from the overlying mucosa, via a sinus tract.

In the adult mammal the suppression of the activity of the epithelium (the sheath of Hertwig) after it has performed its dento - formative work is well known. These suppressed epithelium being the rest cells of Malassez. The vitality exhibited by these epithelial cells are uncertain, as they do not undergo a life cycle comparable with that of normal epithelial cells. Tencate (1965) had shown by histochemical experiment - low energy of glycolysis-"Pentose Shunt", that these cells are Dormant. They are vital cells but resting indefinitely in a pre-mitotic phase never undergoing division throughout life - a genetic suppression.

The characteristic lining seen in apical and many dentigerous cysts had poorly differentiated epithelium, often with great variations in the same cyst. The epithelial lined cyst walls are found to act as semi permeable membranes. The cyst cavities are separated from lymphatic channe;ls thus an osmotic imbalance is created between the cyst cavity and the surrounding tissues. This gives chances for alteration of the cyst size due to pressure difference. The cyst fluid has been found to be hypertonic compared to the blood. The electrophoresis of cyst fluids reveal that the general pattern of fluid from apical and dentigerous cysts regularly show less of the large protein molecules than those in the patients own sera. The largest molecules (alpha-globulins) are either absent or present in very small amounts while albumin which is a relatively small molecule is present in amounts comparable with blood plasma. It has been demonstrated that the origin of the majority of cyst fluid proteins is from serum and the cyst wall acting as a dialysing membrane, restrains the proteins selectively according to their molecular size. This finding is supported by radioactive tracer experiments.

A further important discovery of these investigations was the lack of all soluble protein in fluids from Keratinizing cysts This is related to the impermeable quality of the typical keratinizing epithelial membrane which effectively prevents centripetal diffusion of serum proteins into the cyst fluid.

The fluid in non infected dental and dentigerous cysts has shown an increased gamma-globulin fraction than that in the serum. Recent work has determined 3 basic types of human immuno-globulins to be present. There is evidence to show that the plasma cells which are found in the cyst walls are the probable originators of these antibody globulins.

A fundamental distinction between the two types of origin of cysts is that in one there is true liquefaction of central cells, but not necessarily epithelial cells, which may occur in apical granuloma, and which can be said to be a degenerative process likely to be followed by a simple osmotic expantion. In the other case there is a simple spontaneous proliferation and maturation of buried epithelial cells giving rise to cell

nest formation of increasing size. This process would appear to be associated with many cysts of developmental origin and are seen most clearly in the so called primordial cyst of the jaws. These cysts invariably display keratinizing or parakeratinizing epithelium. Keratosis is not typically observed in apical cysts.

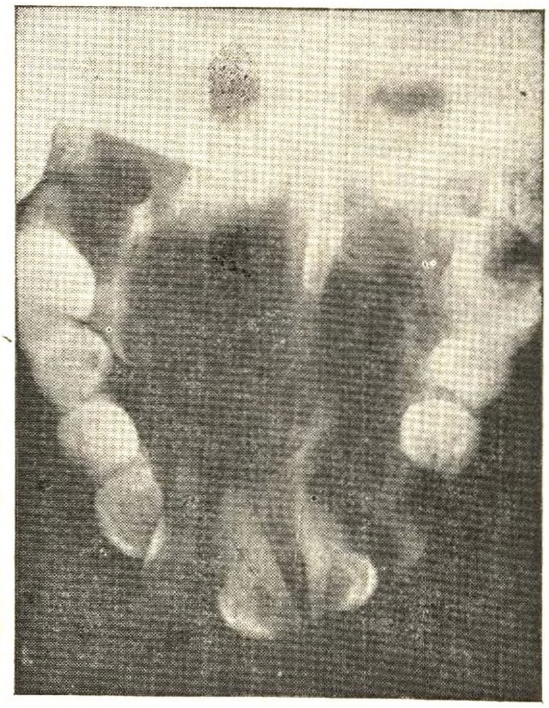
Apical Cysts. – Origin and Growth.

Of all cystic lesions in the jaw this is the commonest type. The root canal infection associated with pulpal death is believed to be the initiating factor responsible for the pathological change. In a large number of cases the tooth dies from extension of deep caries In others direct injury from a blow or a fall or accidental pulpal exposure during operative surgery for caries causes the death.

In all these cases Bacterial invasion occurs into the pulpal chamber, micro-organisms reach the periapical tissues, and chronic low grade infection will ultimately lead to the ormation of a granuloma The chronic apical abscess implies a collection of dead and dying cells in the centre of a granuloma (repair by granulation tissue in association with a dead tooth) This granuloma often lies in an area where epithelial rests exist and these rests may be aroused from their dormant condition and stimulated to proliferate along with other tissues - Hyperplasia. If an active epithelial cell finds itself on the surface of the abscess cavity it will display its natural tendency to spread over a raw surface. If the epithelium is not destroyed by infection or by foreign body reaction and succeeds in covering the entire raw surface the mass of dead and dying tissues constituting the core of the abscess will be isolated from the tissue spaces and lymphatic drainage.

If the osmotic tension of the degenerated central area is above that of the surrounding tissues, then, fluid will be drawn into the area in an attempt to bring about equilibrium. This raises the internal pressure with a resultant slight outward pressure on the adjacent tissues. If this exceeds the capillary pressure, the immediately adjacent capillaries are compressed. This may produce a local ischaemia which in turn brings about further degeneration of the centrally placed cells, and other cells in the wall subjected to the pressure effects. This process will continue if the cyst wall as a whole remains semi - permeable. At the commencement of a cyst it seems necessary that it should be fully lined with epithelial cells - to wall off the abscess contents. At a later stage the layer of pressure atrophied connective tissue itself may constitute a semi - permeable membrane. The growing cyst causes pressure atrophy of the surrounding bone leading to resorption at the same time deposition of bone by periosteum takes place. This continued process presents a thin bony walled cyst cavity at clinical examination.

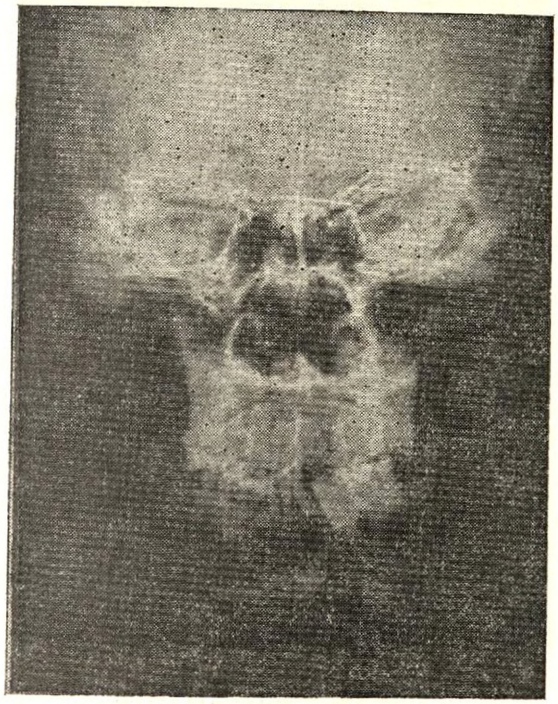
This prevailing view on the natural history of apical cyst is illustrated above, but the exact mechanism of cyst formation and growth can only be surmised. Several controversial theories have been advanced to explain the histogenesis from the time of Malassez in 1885.



Patient's Occlusal X'ray Photograph.

Dentigerous Cysts. Its Genesis.

The next commonest type that we encounter is the dentigerous cyst which involves an unerupted, impacted or ectopic tooth or denticle, which in order of frequency is the mandibular 3rd molar, maxillary canine, maxillary 3rd Molar and finally the other teeth in the arch.



Dentigerous cyst arising from canine in the mandible.

Toller says that this term "Dentigerous Cyst" is an imprecise definition of a clinical condition and that it only implies a certain physical relationship of a tooth to the cyst, but unfortunately gives no indication as to the true nature of such a cyst – whether it is a derivative of infection, degeneration, development or neoplasm.

However it is difficult to assess the possibility of a buried tooth, if left within the jaw to give rise to a dentigerous cyst.

Thoma in 1960 had suggested that dentigerous cysts originated by a degeneration of the Stellate reticulum of the enamel organ. Of this the central type has its origin over the axis of the crown and the lateral type presumably starts a little later in the crown development. But as a matter of fact, it has long been observed that the tooth within the cyst generally showed no abnormality of the crown enamel calcification. Histologically it has been demonstrated that the stellate reticulum condenses with internal and external enamel epithelium to form enamel epithelium which is essential for laying down and calcification of the crown.

Others had suggested that the origin of Dentigerous cysts may be either by proliferation and later cystic breakdown of the peripheral cells of the reduced enamel epithelium or the primary separation of this membrane from the surface of the enamel crown by a collection of fluid between the layer of reduced enamel epithelium and bare enamel crown surface.

Rushton in 1941 and independently MacGregor in 1945 had stated that the reduced enamel epithelial cells are vital, but they are dormant and become active by failure of genetic inhibiting mechanism due to unknown reasons.

The primary dentigerous cyst arising from the breakdown of proliferating cells of the follicle following impeded eruption has been cited.

The excessive cellular activity in the case of a buried tooth has been co-related to the abortive attempt to erupt. This had been shown and explained by Tencate from his histo-chemical studies. He had confirmed suggestions of Weinman et . al that in impeded eruption, it is conceivable that this epithelial activity could result in whorls and intra epithelial breakdown to form cysts.

The growth of non-keratinising dentigerous cyst is by osmotic pressure expansion. The epithelial proliferation plays a secondary part in the mature state of these cysts.

The primordial cyst which is a follicular cyst has been defined by Kronfeld 1949 and Thoma 1950. It is also termed odontogenic keratocyst. The interesting feature is keratinization of epithelial lining or at least passing into a state of parakeratosis. Pindborg and Hansen have reviewed 30 cases and called them 'Keratocysts". This term was

suggested by Philipsen in 1956. Professor Kramer had corelated these Keratocysts with primordial cysts.

Fickling in 1965 reviewed many cases and stated that these Keratocysts have a clinically high rate of recurrence. In an Aspiration biopsy the cyst fluid is found to be thick, milky white or flocculent and easily mistaken for pus, the fluid containing high proportion of desquamated "keratin", while cholesterol is less evident or absent.

Malignant changes in Odontogenic Cysts

1. Occasionally an Adamantinoma may arise from the remnants of an imcompletely removed cyst lining but Adamantinomata may have been mistaken for multiple dentigerous or apical cysts at provisional diagnosis.

2. Although rare in incidence, there is evidence to show that benigh odontogenic cysts may undergo malignant transformation into Carcinoma.

Kay and Kramer 1962 has shown cases where squamous cell carcinoma had developed from dental cysts.

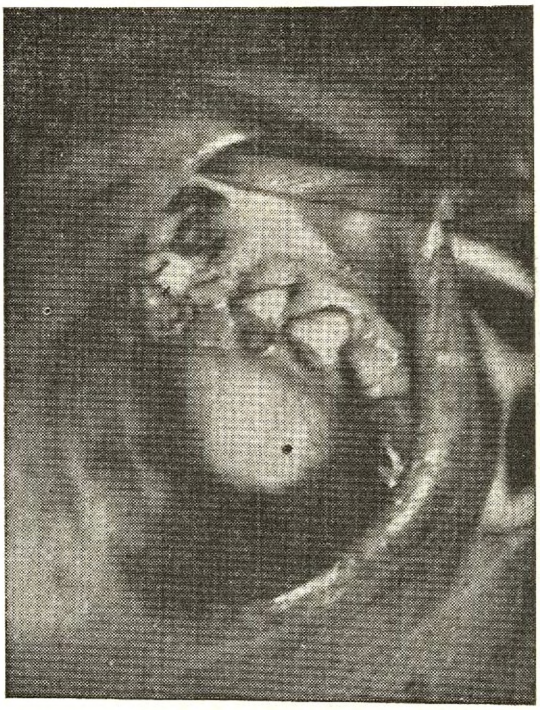
Histopathology of Odontogenic Cyst

The cyst sac has a fibrous connective tissue wall which is usually moderately vascular. It may be infiltrated with inflammatory cells, cholesterol slits, foreign body giant cells and Russell bodies. Blood Pigments may or may not be present.

Lumen is lined with stratified squamous epithelium which varies in thickness, may be ciliated, the cells being cuboidal or columnar.

Cyst Contents

In uninfected cysts the fluid is straw coloured with a glistening sheen of cholesterol crystals.



Dental cyst - Intra-oral picture

In infected cysts fluid may be yellowish thick pus, or sometimes cheesy material.

Conclusion

An attempt was made to review the literature on this subject, which I hope would have fascinated most of us. This subject is very exhaustive and complicated. Numerous Dental Scientific workers had studied the mechanism of Genesis of these cysts. New concepts are being worked out to postulate various theories in preference to the older ones for a much clearer picture of the Pathogenesis. The elucidation of these is a task for the future.

Reference:

1. H. C. Killey & L. W. Kay — *Benign Cystic Lesions of the Jaws.* (*Livingstone. 1966*)
2. Paul Toller — *Origin and Growth of Cysts of the Jaws. Annals of the Royal College of Surgeons of England. - Vol 40., No. 5., May, '67*
3. Gunner Martenssen — *Cysts and Carcinoma of the Jaws. Oral Surgery, Oral Medicine & Oral Pathology. - Vol 8. No. 7 of 1955*
4. Symposium on Bone Cysts. — *Oral Surgery, Oral Medicine, Oral Pathology Vol 8, No. 9 of 1955.*
5. Joseph L. Bernier. — *The management of oral Disease* (*St. Louis Mosby Co. 1955*)
6. Hurt H. Thoma. — *Oral Surgery* (*St. Louis MosBy Co. 1963*)
7. Hubert H. Stone. — *Oral and Dental Diseases.* (*Livingstone. 4th Ed. 1962. p 817-*)
8. John K. Paul. — *Recurrent dentigerous Cyst evidencing ameloblastic proliferation. Report of case. Journal of Oral Surgery Vol: 27. No. 3 1969.*
9. William E. Durbeck. — *Diagnostic Oral Roentgenology.* (*Henry Kimpton. 1948*)
10. Lucus R. B. — *Pathology of tumours of the Oral Tissues* (*1964 - London Churchill*).

COMMON PROBLEMS IN CHILDREN

V. THIRUVADIVEL *B. D. S. (Cey.); F. D. S. R. C. S. (Eng.); (Edin.)*

S. SIVASUBRAMANIAM *L. D. S. (Cey.); D. Orth. R. C. S. (Eng.)*

Children attending an orthodontic or children's clinic present a variety of problems. Some of the common conditions met with and their treatment are reviewed here.

Median Diastema:

This is a common source of worry to parents. It is invariably present as a development space in the 'Ugly Duckling' stage when the upper permanent central incisors first erupt. The diastema decreases somewhat with the eruption of the laterals and finally closes with the eruption of the canines. The space in the midline that persists in the adult dentition should be investigated. It may be part of a general spacing in the dentition or due to diminutive or absent laterals. A supernumerary must be excluded. A fleshy prominent frenum is not as common a cause of a diastema as is usually believed. Frenectomy in such cases is indicated only after radiographic examination. An intra-oral radiograph should reveal a wide inter-premaxillary space lined by two parallel thin white lines. This represents the thin cortical bone on either side of the fibrous insertion. This fibrous insertion along with the fleshy frenum should be removed before any attempt at orthodontic approximation of the centrals.

Crowding:

This is very commonly seen in the labial segments in the mixed dentition especially in the lower labial segments. An expression of crowding suggests serial extractions as a method of treatment.

The aims of serial extractions are:-

a. To alleviate crowding in anterior teeth
b. To allow unerupted teeth to guide themselves into favourable positions
c. To reduce appliance therapy

It is best to confine this method of treatment to class 1 malocclusions only.

The presence or absence of spacing in the labial segments in the deciduous dentition is no firm indication of future crowding or spacing in the adult dentition. Space for the larger succeeding permanent incisors is made by growth in the inter-canine regions and a slight labio-inclination of the incisors at the time of eruption. It is therefore best to wait till the age of 8 - 10 years before embarking on serial extractions.

Clinical and radiographic examination must confirm that the first molars are of good quality, that all teeth are present and are of normal shape and size and in normal position; that the state of development of the premolars are ahead of the canines In cases where the canines seem to be developing ahead of the pre-molars, extraction of the first deciduous molars may be done in place of the canines to promote the early eruption of the premolars. The labial crowding i eased by a distal drifting of the deciduous canines. A careful assessment must be done regarding suitability for such treatment, timing of extractions and the need for space retainers. The early removal of the deciduous canines is said to produce scar tissue and sclerosis of bone in that region, resulting in the high labial eruption of the canine. A too early extraction of the deciduous premolars may result in space closure from behind, necessitating space maintenance. The disadvantages of this method of treatment are that there is no guarantee that future appliance therapy will not be needed; any rotation of the lateral incisors will not correct itself even after creation of space; and the variable sequence of eruption of the canines and premolars.

Supernumeraries:—

They are frequently encountered in the premaxillary region. They are often small and peg shaped or tooth - like ie. supplemental teeth. They may be single or multiple,

unilateral or bilateral either erupted or unerupted. Supernumeraries are usually situated palatal to the teeth of the normal series if not between them. They may lie horizontally or adopt an inverted position or be responsible for an odontome or a dentigerous cyst. It is the common cause of rotation, spacing, mal or non eruption or delayed eruption of the permanent incisors. A diastema is one of the minor irregularities produced. Supernumerary teeth lying high up near the floor of the nose or more posteriorly placed in the hard palate usually have no effect upon the alignment of the teeth. The presence of erupted supernumerary tooth, non-eruption, rotation, mal-position or spacing of incisors necessitates radiographic investigation. The principle of parallax and the vertex occlusal projection are useful to reveal the bucco-palatal relationship of the supernumerary to the dental arch. A standard occlusal radiograph is useful to check whether there are any more supernumerary teeth in the arch. The position and proximity of the supernumerary to the root of the permanent incisor teeth and any fusion with them should be looked for. Fusion of the supernumerary to the permanent incisor is rare. Radiographs will also reveal the state of apical closure of the incisors. Supernumeraries should be removed as soon as possible after the time of eruption of the adjacent permanent teeth. If not removed sufficiently early, it may cause dilaceration of the roots of one more of the incisor teeth whose eruption is impeded. Removal of the offending supernumerary tooth frequently allows the abnormally placed incisor to erupt and align itself without orthodontic intervention. If removal is delayed orthodontic treatment with appliances may become necessary. In the case of palatal displacement of the central incisor it may be necessary to gag the posterior teeth, if the reverse overbite exceeds the interocclusal clearance. It is advisable to incorporate a palatal spring to move the central incisor quickly over the bite. Rotation of teeth takes a long time to correct; multiple rotations are best treated with a fixed appliance. Some authorities feel that surgical intervention may interfere with the apical closure of the developing tooth causing further delay in eruption and it is best to wait till apical closure is completed.

Delayed Eruption:

The common teeth to present this problem are the upper canines and central incisors. Dental development and eruption varies greatly in individuals and it is unnecessary to uncover their crowns if they are judged to be normally placed and there is adequate space and absence of any obstruction for their normal eruption. A hurried exposure to expedite the eruption of a central incisor often produces a higher labial gingival margin which is unsightly. Sometimes even after the removal of an offending supernumerary tooth, it becomes necessary to uncover the crown of the incisor teeth to hasten their eruption. Some authorities feel that complete exposure of the normal incisors and removal of follicles increase the amount of scar tissue formation and impede natural eruption. Even after the removal of supernumeraries, the follicle should not be scraped out or disturbed because this may produce damage to the adjacent teeth or even ankylosis of the erupting tooth.

The maxillary canine has the greatest distance to travel of all teeth before reaching its final occlusal level and it is therefore likely to be affected by factors causing displacement. Unerupted canines are often discovered during routine radiography. Some patients present with a retained deciduous canine or malpositioned lateral incisor or a palatal lump. If there is no sign of eruption of a maxillary canine in a patient after the age of fourteen years, its position should be investigated. Clinical and radiographic examination is necessary to assess the position of canine for proper treatment planning. Any angulation of the adjacent teeth, swelling of labial mucosa and mobility of deciduous canine and lateral incisors should be noted. Peri-apical, occlusal, parallax radiographs and lateral and postero - antero skull views are often required to locate the exact position of the buried canine. Intra oral radiographs will reveal the following:- presence or absence of the tooth, cystic involvement, root curvature, apical resorption of the deciduous canine and lateral incisor. Tube - shift or parallax method will reveal the bucco - palatal relationship of the canine to the dental arch. (moves with the tube-palatal; moves in the opposite direction - labial).

Posteroanterior view reveals the true position of the tooth in relation to the mid-line and its inclination in the sagittal plane. Lateral skull view reveals the height of the tooth and horizontal angulation. The long axis of the tooth represents the path of eruption. The method of treatment may be one of the following:- leave it alone; surgical removal; exposure; exposure and orthodontic traction or transplantation. When it is retained or impacted and does not cause resorption or tilting of the lateral incisor or other teeth or when there is no cystic involvement, it can be left alone. However periodic radiographic examinations are advised. When the first premolar is in contact with the lateral incisor and the former is mesio-palatally rotated the canine may be extracted. Exposure is indicated for canines if there is delayed eruption when the tooth is in its normal axis. Uncovering the crown by removal of muco-periosteum and bone if necessary will allow the tooth to erupt on its own When the axis of the tooth indicates that it will erupt out of arch alignment (palatal or labial) orthodontic traction is used to guide the tooth into the arch

Traumatic Injuries to Anterior Teeth.

Traumatic injuries to deciduous anteriors do not call for extensive conservative procedures However, conservative measures should be taken to alleviate pain, prevent infection and trauma to the lips and to ensure normal food intake. It should be borne in mind that trauma to the deciduous teeth can cause dilaceration or hypoplasia of the permanent incisors depending on the latter's stage of development. Injuries to the permanent anteriors call for careful assessment and treatment planning. The decision to save traumatised teeth will depend on several factors. They are the severity of injury, crowding of the labial segment, stage of root formation and attitude of the patient. Every case should be judged on its own merit. Some of the salient features in the treatment plan only will be mentioned. Fracture of the crown not extending more than five millimetres beneath the gingival margin can be treated conservatively A tooth with oblique fracture of the root communicating with the oral cavity necessitates extraction. In a grossly crowded labial segment a traumatised tooth can be the tooth of choice for extraction to relieve crowding. When the upper central incisor cannot be saved it can be sacrificed and the lateral incisor moved into its position and may be crowned to simulate the central incisor. Teeth with open apex with pulp exposure should be treated conservatively depending on the lapse of time since the accident Depending on the extent of pulp exposure a decision to perform pulpotomy or pulpectomy is taken. A paste of Calcium hydroxide can be inserted just one millimetre short of the apical foramen after pulpectomy to allow completion of the root. Continuation of root development has been recorded after the above procedure. Periodic radiographic checks are made at three monthly intervals to ascertain whether the root formation is proceeding apically or a calcific barrier is formed. In either case a conventional root canal treatment is indicated later.

SOME ADVERSE EFFECTS OF THERAPEUTIC RADIATION.

R. GUNATILAKA *B.D.S. (Ceylon)*

It has been found that ionising radiation (X'rays, Gamma rays & Cosmic rays) would definitely produce degenerative changes in various tissues and organ systems of the body. This subject has been studied by many dental research workers who have contributed substantially to the understanding of the actions of ionising radiation on oral tissues. In this paper reference is made mainly to therapeutic radiation as this concerns the part that has to be played by the dental surgeon in relation to oral cancer.

Radio sensitivity vary from one kind of tissue to another. This was studied by many workers who found the following order of radiosensitivity.

1. Lymphocytes
2. Erythroblasts and Granulocytes
3. Myoblasts
4. Epithelial Cells
5. Endothelial cells
6. Connective tissue cells
7. Bone cells
8. Nerve cells
9. Brain cells
10. Muscle cells

In addition to each cell group sensitivity, each cell type appears to be more radiosensitive during mitosis, during periods of increased metabolism and during their embryonic or immature stages.

The changes that take place in various tissues following radiation are of great importance in subsequent planning of any further treatment. From the point of view of the dental surgeon there are certain tissues which **should** be given more consideration.

Bone:

Ewing found the periosteum very susceptible to irradiation; gross swelling and thickening and the periosteum stripping easily from bone after sizeable therapeutic doses. An histological examination revealed the inner surface of the periosteum presenting a thick hyaline layer, without cells; and the layer of osteoblasts usually found on the inner surface of the periosteum in contact with bone may be absent. This explains the lack of bone regeneration after sequestrectomy or subperiosteal jaw resection, The arterioles probably get strangulated by a postirradiation swelling of all the coats comprising the walls of the blood vessels. This is another reason why reconstructive surgery is difficult in cancer patients. Bone grafts are usually not attempted, for it usually fails. Further changes were observed in bone itself. Bone shows osteoporosis, the trabeculations appear to be narrowed and irregular the volume of fatty marrow increased, and nutrient vessels show obliterative sclerosis These changes are greater in patients past middle age. as in a person of this category who is not irradiated may show the above changes to a certain degree. Thus the changes of osteoradiation necrosis occuring in older patients are much more severe

Owing to the fact that these changes take place following irradiation, it is of great importance to attend to oral hygiene of all patients with great care, prior to irradiation. Further, irradiation produces stomatitis and reduces blood supply to the periosteum and bone, decreasing bone cell activity and resistance to infection. If poor oral hygiene is present at this stage, pathogenic organisms will find their way between loosened teeth and gum margins, and proceed to bone to set up an acute suppuration.

Hence it is clear why the teeth in the field of radiation and any septic teeth should be removed; oral hygiene attended to and the patient be prepared for radiation at least 10 to 14 days prior to the commencement of the course of therapeutic irradiation for oral cancer. It is the greatest responsibility of the dental surgeon to have a comprehensive knowledge of the postirradiation changes in the soft tissue and bone as it is essential with subsequent problems of dentures, prosthetic appliances, oral hygiene and extractions. Therefore any surgical procedure of the irradiated area should be limited to those that cannot

be avoided. However as a rule of thumb no operation which would admit bacteria to the irradiated bone should be performed for at least 5 years after irradiation and if performed should be under adequate and suitable antibiotic cover.

Another important aspect is the irradiation of the jaws of the young, specially for sarcoma, which may damage the growth centre in the mandibular condyle resulting in unilateral under-development. Today this problem is less likely to be seen with the advent of megavoltage therapy.

Mucous membrane:

Irradiation usually produces an inflammatory reaction in the skin and the mucous membrane. The severity varies from individual to individual. Histologically, in the blood vessels various changes leading to occlusion of the lumen, the inflammatory reaction in the corium and degenerative changes in the epithelium are seen.

The tongue shows atrophy of the papillae and becomes smooth: sometimes ulceration occurs. It comes back to normal but the duration may vary. Mucous and salivary glands will be affected and the mouth becomes dry. This again becomes a problem in the prosthetic rehabilation of the patient and the mucosa is more liable to be injured exposing the underlying bone leading to infection ending in necrosis.

Teeth:

With heavy doses of irradiation during tooth formation the teeth may be malformed, even completely destroyed In children the eruption of teeth may be delayed along with exfoliation of the deciduous teeth. Roots of the permanent teeth may be reduced in size, and their formation may be retarded.

If an oral cancer is irradiated without removing the teeth in the field of irradiation, it is observed that in the ensuing year these teeth with their diminished blood supply, develop caries (usually cervical caries.) and probably due to limited cleansing, become soft, crumble and loosen

These are some adverse effects of therapeutic radiation which will be of paramount importance to the dental surgeon who is expected to diagnose, prepare and rehabilitate all patients with oral cancer. In Ceylon the commonest form of cancer is oral cancer. Statistics show it is in the region of 60% of all cancers This paper deals with one aspect of the problems to be faced in the management of oral cancer.

References:

Review of Research in Radiation Biology
Frank Sobowski A. D. A. J. Vol. 76, No: 1381-87

Generalised Skeletal Response to Local Radiation
Radiation Res. 2718, 1967.
Babikly A & Kolar J.

Age & Dose Dependents of Bone Growth Retardation Induced by Radiation Reaction
Phylipps R. D. & Kimeldorf D. J.

Dental Roentgenology -
Ennis & Berry

THE SCHOOL DENTAL SERVICE - A REVIEW

H. G. PERERA *L.D.S. (Ceylon) H.D.D. (Cey.)*

The School Dental Service in New Zealand so impressed the then Director of Health Services of Ceylon, who visited that country in 1946, that on his return to Ceylon, he strongly recommended to the Ceylon Government to establish a similar system in this country too. "Finance proved a barrier to immediate action, but some four years later, when the Colombo Plan had come into operation the Ceylon Government requested the assistance of New Zealand under the Plan and this was granted..... ... In 1951, as a first step, New Zealand accepted six girls from Ceylon to be trained as school Dental Nurses. A Second group followed in 1952." Senior officers from the School Dental Service in New Zealand were regularly sent to Ceylon to advise and assist the local authorities to organise the School Dental Service in Ceylon, and establish a Training School for dental nurses. It is significant that Ceylon was the first country to receive aid from a developing country under the Colombo Plan, which had its origin in Ceylon*.

The first batch of students to the Training School at Maharagama was recruited in 1955 and since then twelve batches of students have completed their training. The present strength of School Dental Nurses is 234. After completion of their training, these nurses are posted to School Dental Clinics. To begin with, these clinics were opened in and around Colombo. Subsequently, this service was taken to the other provincial towns. More recently, schools in rural areas have been brought into this scheme. At present there are 124 School Dental Clinics, scattered in different parts of the country.

These School Dental Nurses are employed exclusively by the state, in the School Dental Service. Each School Dental Nurse is expected to have a group of at least 500 children between the ages 3 – 13 years, for whom she has to provide dental care at six month intervals. Dental Health Education is also an important function of the School Dental Nurse. In other words, a child coming under the care of the School Dental Nurse, should at 13 years, possess a sound set of teeth and also appreciate the importance of a healthy mouth, the relationship of dental health to general health and observe dental health practices including proper diet and oral habits.

In all the countries, where this type of auxiliary has been employed, it has been found that the quality of work was high and the work in health education was valuable. They are well accepted by the children, parents, teachers and the community in general. These auxiliaries are capable of performing certain types of operations safely and to a high standard.

In Ceylon, as in most countries, the dental manpower is far short of the actual needs. With increase in population and on account of very high prevalence of dental disease, the need for dental care greatly exceeds the available resources. Consequently the dental Surgeons alone cannot provide a satisfactory dental health Service. They must be relieved of carrying out routine and mechanical treatment so that they would be able to make the best use of their time and knowledge for the benefit of a larger segment of the population. It was for these same reasons that many countries considered the use of auxiliaries to carry out dental health work e. g. chairside assistants, dental laboratory technicians, dental hygienists and school dental nurses.

It is estimated that there is a child population of 3.9 million, in the age group 2½ – 13 years. On the basis that one school dental nurse looks after the dental health of 500 children from this group, only 117,000 children would have been provided with regular dental care by the School Dental Service. Therefore the expansion of this service that is required to cater to 3. 9 million school children is enormous. The cost to the State in opening one school dental clinic is in the region of Rs. 6000.00. This excludes the cost of the building, which

is expected to be provided by the Parent - Teacher Association or some welfare organisation. Even here the State very often has to step in and subsidise to some extent. Considering the cost to the state in training the School Dental Nurses, equipping and maintaining the clinics, payment of salaries etc., it is necessary to ascertain whether the objectives of the School Dental Service are being fulfilled, and whether there are any deficiencies.

Seventeen years after the introduction of this scheme to this country, it can be said that the service has proved its usefulness. This is borne out by the following facts:-

1. Parents now take a greater interest in the dental health of their children than before. Children are gradually getting used to attending dental clinics without fear. Parents also take an interest in their own teeth, thereby setting an example to children.

2. Before the introduction of the School Dental Service - dental treatment was available only at government clinics and private practitioners. This service provides dental care to a section of the population that had hitherto been neglected.

3. This service has provided a medium for the propagation of knowledge on dental health. Fear, ignorance and indifference have been dispelled from children and parents to a fair extent.

4. It has been observed that the oral hygiene of children who have benefitted from this service is good.

5. The need for extraction of teeth due to caries has been greatly reduced.

6. Malocclusions are detected early and parents advised regarding specialised treatment.

7. The Dental Surgeons have been relieved of a considerable amount of work, thereby enabling them to devote their time to more important work.

Having established that the School Dental Service is doing useful work, we should now consider any deficiencies in the service. Some of these deficiencies are listed below

1. The success of the School Dental Service depends on a satisfactory system of supervision. By Supervision, what is actually implied is guidance and direction This is particularly felt in the field of Dental Health Education. The capabilities of the nurses in this direction has not been exploited in the field. At present the 124 clinics come under the supervision of 4 Supervising School Dental Surgeons. The difficulty in assigning a uniform number of clinics to each supervising officer is understood considering the disparity in the number of clinics in each S. H. S. Division. Even if it were so, it is very doubtful that he would be able to carry out his duties in a satisfactory manner, if he is not provided with assistance. In my opinion the position and responsibilities of the Supervising School Dental Surgeons deserve immediate re-thinking.

2. By and large, the majority of the School Dental Nurses are conscientious workers They can be depended on to do good work in the clinics. Their difficulties should also be recognised. The Dental Nurse is responsible for the efficient working of the clinic. She should not be burdened with other work which would deprive them from devoting maximum time to dental health work. Certain clinics in the outstations have only one nurse each. The plight of such nurses, particularly during school vacations can be pathetic. It is foolish to expect such a nurse to give of her best.

3. In the absence of sufficient data on the dental needs of the child population, the allocation of School Dental Clinics has to be decided on the representations made by interested parties. It is time that a comprehensive study be made on the dental problems in the country; Based on such a study, a list of priorities can be worked out. Allocation of clinics can then be made based on the magnitude of the needs. Since the School Dental Service caters to children of the age group 2½ - 13 years, the clinics should be situated in or in close proximity to schools which have children

of this age group. As the school admission age is now 6 years, grades 1-8 will have children of this age group. Therefore as a rule new school dental clinics should be opened only in schools which have classes from grades 1-8. It is indeed a pity that some clinics established in certain Central Colleges are not serving any purpose.

4. What happens to a child at the age of thirteen, if provision is not made for him to maintain his interest in his teeth? Then the valuable work done by the School Dental Nurse over a period of years will goes waste· This needs serious thought. Otherwise it would not be correct to educate a child to look for a service which cannot be provided. Seventeen years after the introduction of the School Dental Service, there are only 4 Adolescent School Dental Clinics. This adolescent service should keep pace with the School Dental Clinics.

5. The progress of the School Dental Service depends largely on the co-operation extended to it by the Education Department, particularly at regional level. Since these clinics are situated in schools, the co-operation of the school staff is also of vital importance. Some of the present difficulties in this regard can be attributed to certain misconceptions. A complete understanding between the Health and Education Ministries on matters pertaining to the School Dental Service is a pre-requisite for the success of this scheme.

The School Dental Service was introduced to this country for the specific purpose of tackling the dental problems of children of a particular age group. At that time the Dental Profession viewed this move with suspicion. This was to be expected. Even in the land of its birth, there had been considerable opposition to this Service in its early years. It can now be said that the School Dental Service is rendering valuable Service and with proper direction, it can be utilised to contribute to a greater degree towards a satisfactory dental service. However, it must be remembered that it is only the dental profession who can assume full responsibility for the management of the dental problems in the country. It is the responsibility of the dental profession to study the dental problems in the country and advise the government on a dental health programme.

* The New Zealand School Dental Service - Its Initiation and Development 1920 - 1960 by J. Llewellyn Sannders.

THE HISTORICAL BACKGROUND TO THE EVOLUTION OF A NATIONAL HEALTH (MEDICAL & DENTAL) SERVICE

A. RANJAN ABEYASINGHE *L. D. S. (Cey.), L. D. S. R. C. S. (Eng)*
Dental Surgeon to M/s. Lever Bros. (Ceylon) Ltd. Medical Centre.

Great Britain: & European Countries.

In Great Britain, until late in the Nineteenth Century Relief of poverty through any cause could only be given under the poor laws or private charity. From such institutions evolved the Present day Social Welfare State of Great Britain.

In most European countries relief of poverty was left almost entirely to the church. A compulsory scheme of insurance was introduced in Germany for the first time in 1885, the example of Germany was followed by Austria, in 1888, and by Hungary in 1891. It is historically seen that at the beginning of the 20th Century, public opinion in most European Countries began to favour some organised provision to meet the contingency of sickness among workers. Following the National Insurance Act of 1911 in England. Compulsory Health Insurance began in 1912. This development in England culminated in the National Assistance Act 1948. With the growth of Social Insurance, the inclusion of medical and Dental Treatment became an important feature in these Schemes.

In 1934 President Franklin D. Roosevelt in a message to Congress called for legislation to safeguard men women and children against misfortune. Thus the Social Security Act was signed in Law on August 14, 1955.

After World War II attention was given to social security in most European Countries as in other parts of the world. The Industrial Labour Conference held in Philadelphia (1944) urged that the sphere of protection of income - security schemes should be progressively enlarged. This was also stressed in the Universal Declaration of Human Rights adopted by the General Assembly of the United Nations in December 10th 1948.

By the middle of the 20th Century The Social Security Schemes were gradually brought into operation in most progressive Asian Countries, including Ceylon.

In the Countries of Northern Europe (Denmark, Iceland, Finland, Norway & Sweden) Social Security plans began to evolve at the end of the 19th and during the first half of the 20th Century.

The various Social Security Systems may be divided into three classes, according to whether they apply in principle.

(1) To all citizens.

(2) To all gainfully occupied persons and their dependents.

(3) To smaller and specified classes of people.

The systems of Great Britain, Norway, and Sweden belong to the first class, to cover all citizens.

The system of compulsory contribution for social insurance in Great Britain came into operation on July 5th 1948, as a result of the report of Sir William (later Lord) Beveridge, the statutes under which the various parts of the scheme were initiated were the National Insurance Act 1946; the National Health Services (Medical & Dental) Act 1946 and the National Assistance Act. 1948. The cost of operating these schemes was to be shared by the insured persons, the employers and the state. Every insured

person was enabled to obtain any of the benefits making a weekly contribution on a single card. This contribution is a nominal amount.

In general every person in England over school-leaving age and under pensionable age became insured in one of the following classes.

(1) Employed persons, i.e. persons gainfully occupied in employment under a contract or service.

(2) Self - employed persons, i.e. persons gainfully occupied but not under contract or service.

(3) Non-employed persons, i e. those not gainfully occupied.

A feature of social security in mid - 20th century was the making of reciprocal arrangements between countries. The various benefits included unemployment, Sickness maternity, Widows and Retirement Pensions.

Ancient Ceylon

Public health was no doubt one of the chief concerns of the rulers of ancient Lanka and they did much to promote it. The tenth Century inscriptions often refer to hospitals and grants and amenities enjoyed by these public institutions for example, the Polonnaruwa Council Chamber inscription refers to a rent paid to a hospital. "The same shall be rented (to yield) interest and one pala of dried ginger measured by lahsu taking 4 admana should be given year after year as rent to hospital (E.Z. 4.1.44) "

In Ceylon Today

During the colonial regime; though there were ample opportunities and wealth to provide Social Security and Welfare, very little had been done for the employee class. The Commercial and planting successes of British rule, did not promote or provide Social Security for the people.

As far back as 1934, a commission was appointed to survey and make recommendations on the problems of Social services in Ceylon. A report recommending the establishment of various contributary social insurance and related systems, particularly **Health Insurance**, unemployment insurance and a national provident fund scheme in addition to certain pension schemes and allowances financed from the general revenue was published .So far only one of these recommendations i.e the National Provident Fund scheme established by the Employees Provident Fund Act, No: 15 of 1958 has been implemented. This Act, No. 15 of 1958 amended by Parliament recently, includes practically most employees, other than those employed in Government and by local authorities.

The self employed and the wage earners form the largest group which is nearly one third of the population. The rest including old - people, non working women and children, the disabled, the mentally defective and otherwise incapacitated persons, depend on the state and charitable institutions for social relief.

In a historical sense the Labour laws first enacted were intended to ensure the services of the workers and to regulate their terms and conditions of employment with penal sections more in favour of the employers. The early laws were designed particularly to regulate the employment of the immigrant South Indian labourers.

It was found as late as 1942 that Ceylonese labour was not so protected as the Indian In the last few decades much has been done by way of legislation to ameliorate the conditions of the workers. Under the existing legislation it may be observed that the

farmers and rural peasantry who constitute a large group receive only a meagre deal by way of relief, compared to the urban factory workers, and the Estate labourers. This particular feature is common to all countries that were under colonial rule. In comparison the conditions of industrial workers, of the highly advanced countries like Britain, U. S. A., Germany and Japan are much better and regulated by considerable statutory protection and benefits conferred on them.

The following are the existing welfare and security schemes in Ceylon:

(1) The Employees Provident Fund,

(2) Workmen's compensation,

(3) Miscellaneous Reliefs,
   a. Maternity benefits,
   b. Medical care, Free feeding of children,
   c. Relief of the poor, orphans and the disabled.

At present a form of Health Insurance (Medical and Dental) for the benefit of the employees is operated by some of the State and Mercantile Sector Institutions. These schemes are worked out on a basis of premia contributed by the employees and a similar contribution made by the Employer. Some of these State Institutions are the Insurance Corporations, Bank of Ceylon, People's Bank, and the Central Bank. There are two categories of schemes, one of which covers the employee only, while the other, includes, the employee, wife and children.

It is to be desired, that these Health Insurance schemes which only cover employees in specific Institutions should be expanded and transformed to cover every individual on a National basis. It is imperative that the next step should be the introduction of a Compulsory Health (Medical and Dental) services scheme so that every citizen contributes a premium, thus inculcating a sense of social responsibility. This should be a contributory scheme, which could be guided by the experience of various countries especially of Great Britain. These National Health Insurance Schemes are an integral part of a Social Welfare State.

References :—

1. Beveridge. Sir William. 1942: (*London*) *Social Insurance and Allied Services.*

2. International Labour Review. 1947; 1948; 1949.

3. Nelson. G. R. (ed). 1953. Freedom and Welfare: *Social Patterns in the Northern Countries of Europe.*

4. Ariapala. M. B. 1956. *Society in Medieval Ceylon.*

5. De. Silva. W. P. N. 1964. *Industrial Law and Relations in Ceylon.*

ON PLANNING A NATIONAL DENTAL HEALTH SERVICE

E. P. FERNANDO, *BDS (Cey.), DDPH (Syd.)*

In planning the Dental Health Service on a National scale one might be tempted to identify shortages in finance and in trained personnel as being the major limiting factors. Viewing the problem in the context of these two factors the emphasis in planning would inevitably shift towards measures directed at a quantitative increase both in the number of personnel and of funds in the belief that correction of these limitations must necessarily lead to the desired result, namely an improved Dental Health Service to the Community.

While the importance of the two factors mentioned can readily be conceded, it is well to recognize a third factor of a qualitative nature which is undoubtedly of equal importance. This is the fact that the average hospital Dental Clinic (and to a lesser extent the private clinic) functions largely as an "Extraction Centre" or Casualty Clinic (if one may use a less drastic term) and not as a Dental clinic proper.

It is not always realised that extraction of a tooth represents failure rather than successful Dental treatment, except in special circumstances such as in 'therapeutic' extractions for Orthodontic purposes. By far the major proportion of teeth extracted at these clinics consists of those in the terminal stages of caries and periodontal disease, thereby implying a failure or absence of both Preventive and Curative treatment. Thus increasing the capacity of the present Service by establishing new clinics without at the same time seeking a qualitative change in the functional nature of the clinics is not likely to result in an improved Service, Rather, such extension is more likely to result in merely establishing more "extraction centres" and thereby enhancing the magnitude of the failure of the Service, albeit a failure of commission rather than of omission.

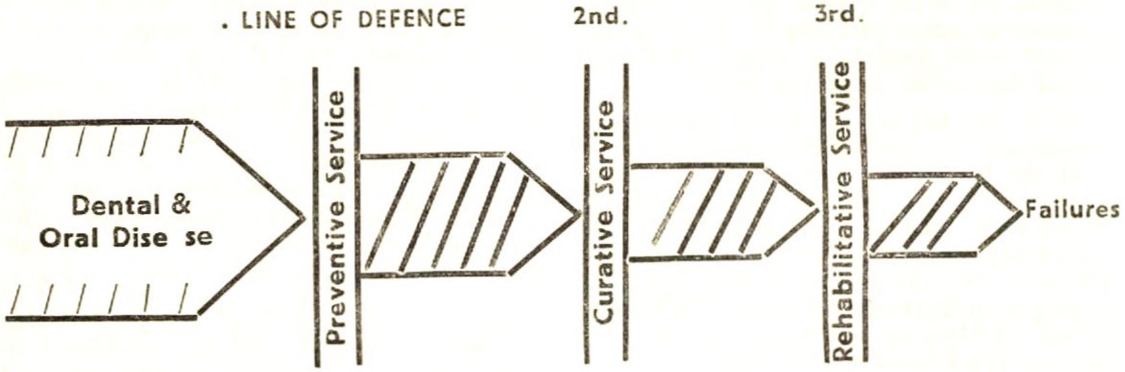
Thus the need to establish a sound preliminary theoretical basis to support and validate subsequent planning activity becomes quite evident. But here again one could easily make the error of attempting to define such a theoretical basis in terms of a single component of Dental disease such as say, Periodontal disease. Although some workers may consider P-disease as indisputably the most prevalent Dental disease in Ceylon, it would be fallacious to conclude therefrom that it is also the major problem of Dental disease in this country. The magnitude of P-disease as a problem in a Public Health Service would depend not merely on the extent of its prevalence but also on other factors such as; to what extent it is responsible for tooth loss, for precipitating acute crises, for loss of working hours by incapacitation and so on. It would be necessary therefore to define the problem in terms of some central concept and make this one's point of departure. In this paper we shall attempt this task.

For a proper understanding of dental disease the tooth cannot be considered in isolation. Its continuity, on the one hand with the supporting structures; the periodontal membrane, alveolar and basal bone, and on the other with the oral salivary environment, must be recognised if a satisfactory overall concept of the field of study is to be formulated. Thus it would not be in terms of Dental disease per se but rather as Dental and Oral disease that one could usefully visualize the problem.

The anatomical area of primary interst to the dentist would then be, not merely the dental tissues as such but the whole complex of oro-masticatory tissues conceived of as a structural and functional unit within the framework of the whole organism. **The pathosis of this "oro-maticatory tissue complex"** would then constitute the problem of dental and oral disease. For practical purposes however the "pathosis" may be considered in terms of its components - Dental caries, Periodontal disease, Malocclusion, Cystic lesions, Neoplasms etc. A visual concept of the problem can now be easily formed to serve as a working model.

On the one hand there is Dental (& Oral) disease that attacks the health of the Community and on the other the Dental Health Services which have to meet this challenge. (for purposes of this discussion we shall consider the role of the Govt. Dental Health Service only since it is by far the major sector).

The Dental Health Service can meet and combat the threat at three lines of defence- Preventively, Curatively and Rehabilitatively. The diagram illustrates this concept very simply :—



The diagram has been reduced to its simplest form to project only the basic concept. Other parameters have been omitted as not being pertinent at this stage, of the discussion.

It will be noted that these lines of defence are in a time sequence. Thus Curative treatment becomes necessary only if the disease has either penetrated or by-passed the first line of defence, Preventive treatment. Similarly the need for Rehabilitation implies a failure or absence of Curative treatment.

By preventive treatment is meant : a) primary prevention – ie. preventing manifestation of the disease e. g. preventing dental caries by water fluoridation and b) secondary prevention – e. g. preventing extension of or the sequelae to a disease once manifest. e. g. preventive conservation to control dental caries. Curative treatment needs no elaboration except to state that correction of an orthodontic problem once manifest is classified as curative treatment.

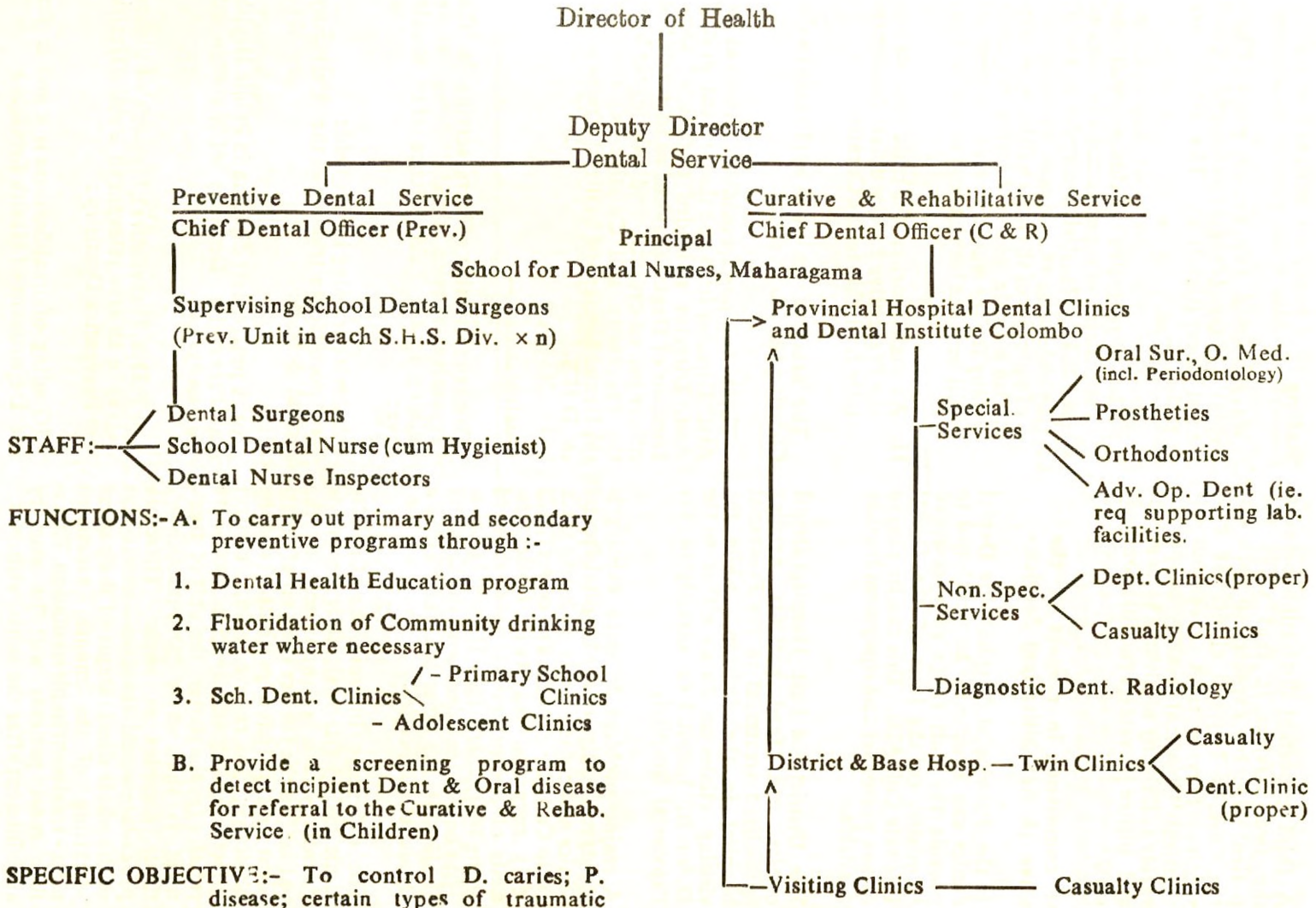
Rehabilitative treatment refers to measures directed towards re-establishing by artificial means the integrity of the Oro-masticatory tissue complex disrupted by disease or injury. e.g. a prosthetic appliance or an amalagam restoration.

The organisational problem for the Dental Service could then essentially be posed as follows:— How best to deploy its resources and armamentaria to the three lines of defence to secure maximum protection of the Community? The annexed diagram is one possible organisational grid It is largely self explanatory but some elucidatory comments will be necessary.

Justification for proposing separation of the Preventive from the Curative (& Rehabilitative Service :—

I. Though not always appreciated a Preventive Service demands a fundamentally different approach from what would obtain in a Curative Service. Thus in the former the approach is through the epidemiology of Dental disease, investigations in terms of group surveys, and treatment via programs directed towards the "group" rather than the "individual".

II. Most Dental diseases are cumulative and begin in childhood and early adulthood. Thus to be maximumly effective and economically feasible a Preventive Dental Service must be directed primarily to these age groups.


Director of Health
Deputy Director
Dental Service
Preventive Dental Service
Chief Dental Officer (Prev.)
Principal
School for Dental Nurses, Maharagama
Curative & Rehabilitative Service
Chief Dental Officer (C & R)
Supervising School Dental Surgeons
(Prev. Unit in each S.H.S. Div. x n)
STAFF:
Dental Surgeons
School Dental Nurse (cum Hygienist)
Dental Nurse Inspectors
FUNCTIONS:- A. To carry out primary and secondary preventive programs through :-
1. Dental Health Education program
2. Fluoridation of Community drinking water where necessary
3. Sch. Dent. Clinics - Primary School Clinics
- Adolescent Clinics
B. Provide a screening program to detect incipient Dent & Oral disease for referral to the Curative & Rehab. Service (in Children)
SPECIFIC OBJECTIVE:- To control D. caries; P. disease; certain types of traumatic injuries and malocclusion in the "Child & Young Adult" population.
Provincial Hospital Dental Clinics and Dental Institute Colombo
Special Services
Oral Sur., O. Med. (incl. Periodontology)
Prostheties
Orthodontics
Adv. Op. Dent (ie. req supporting lab. facilities.
Non. Spec. Services
Dept. Clinics(proper)
Casualty Clinics
Diagnostic Dent. Radiology
District & Base Hosp. — Twin Clinics
Casualty
Dent. Clinic (proper)
Visiting Clinics — Casualty Clinics

III. A third important distinction between the two Services is that while the patient might be expected to seek out the Curative hospital clinic, the Preventive Service must seek out its "patients" Normal healthy people are rarely sufficiently motivated to seek out and utilize preventive facilities on their own.

Some comments in respect of the Curative (& Rehabilitative) Service:-

I. In the Provincial hospitals the Dental clinics can eventually be developed to provide the full range of specialised Dentistry, on the lines of the Dental Institute Colombo. This can be phased out as personnel and equipment become available.

II. The District and Base Hospital Dental clinics can feed patients needing specialised treatment to the Provincial hospital in the division, while the visiting clinics can do so either to the D. or B. hospital or directly to the Provincial hospital.

III. A major problem hitherto existing is the overcrowding of the hospital Dental clinics and consequently reducing them all to Casualty clinics. To correct this it is suggested that twin clinics (ie. units of two surgeries) be established at the District and Base Hospital clinics. Thus one unit can deal with the Casualty clinic while the other can function as a Dental clinic proper.

The difference between the Casualty clinic and the Dental clinic proper is essentially one of approach to the patient. In the former the unit of treatment is the lesion presented, and the objective; to relieve pain, control infection and generally give immediate relief. In the latter the unit of treatment is the whole Oro-masticatory tissue complex as such. Therefore procedure would involve:— assessment of the whole dental status of the patient - charting of the mouth;- treatment plan:- treatment implementation. Therefore most patients will be seen by appointment after the initial visit.

Staffing.

We suggested two senior posts; Chief Dental Officer (Preventive), and Chief Dental officer (Curative). The reasons are as follows:-

I. The Preventive Scheme will be functioning in separate units in each of the S. H. S's divisions under a senior Dental surgeon. Hence co-ordination of activities of the units will be necessary. Also a single officer bearing responsibility for the whole Preventive program will be in the best interest of the Service.

II. As stated earlier the basic approach to the Preventive Service differs fundamentally from that to the Curative.

The same reasoning is applicable to the Curative (Rehab.) Service.

These two posts could be placed at the Asst. Director level and the present post of Asst. Director upgraded to that of Dep. Director of Dental Services so that this last officer can co-ordinate and administer both the Preventive and Curative segments of the Dental Service and be directly responsible to D.H.S.

Qualifications :—

We suggest that officers serving in the Preventive Service should have some training in the field. Hence they should have :

inservice training in the field :
or postgradute training at the University Dental School :

or A postgradute diploma in Public Health and Preventive Dentistry of a recognised University.

or F.D.S. (Preventive), Master's or higher degree in an area relevant to Public Health and Preventive Dentistry :

(Grading of qualifications is a matter for the Department of Health Services.)

In the Curative (& Rehab.) Service the specialised training that would be necessary could be obtained through qualifications such as, F.D S , Dip. Orth., and Master's degrees in the relevant areas.

In making these proposals we have endeavoured to guide our thinking in accordance with the following principles:-

1. Avoidance of proposing rigid inflexible measures that cannot be easily adapted to changing conditions.
2. Utilization of existing infrastructure and modification and extension of existing facilities in preference to innovating drastic changes.
3. Consideration of each measure in terms of its economic viability.
4. Visualizing the problem as a total concept rather than in a fragmentary manner.

MEDICAL PERSONNEL TARGETS FROM THE WORLD BANK REPORT — 1952

	No. available	*Approximate ratio to present population*		*Ratio suggested be attained for a population of 12 5 million*	*Number required in 1972*
		In Ceylon	*In U.K.*		
Doctors	1,100	1 : 6,800	1 : 1,000	1 : 3,000	4,167
Nurses	1,500	1 : 5,000	1 : 3,00	1 : 1,000	12,500
Midwives	1,500	1 : 5,000	1 : 600	1 : 3,000	4,167
***Dentists**	**30**	**1 : 25,000**	**1 : 2,800**	**1 : 6,000**	**2,083**
Apothecaries	800	1 : 9,400	—	1 : 5,000	2,500
Sanitary Inspectors	707	1 : 1,0000	—	1 : 5,000	2,500

ATTENDANCE AT CLINICS HELD IN HOSPITALS

Nature of Clinics	Provincial Hospitals	Base Hospitals	District & Other Hospitals	Colombo Group of Hospitals	Hospitals for Special Campaigns	Total
1. Medical	98.184	38,613	11,999	55,840	—	2,04,636
2. Surgical	64,520	38,737	16,835	23,387	—	1,43,479
3. Orthopaedic	25,870	2,199	5,213	41,671	—	74,953
4. Thoracic	3,653	—	1,598	1,081	—	6,332
5. Neuro-Surgical	—	—	—	8,715	—	8,715
6. E N. T.	74,521	26,078	8,021	58,311	—	1,66,931
7. Genito-Urinary	—	—	—	2,863	—	2,863
8 Skin	29,620	3,333	7,173	52,256	—	92,382
9. Nerve	—	—	—	9,018	—	9,018
10. Paediatric	36,251	25,370	8,725	7,481	—	77,827
11. Psychiatric	18,407	8,317	1,698	20,173	11,815	60,410
12. Epileptic	4,592	—	51	10,060	—	14,703
13. Leprosy	—	—	—	—	2,183	2,183
14. Anti-rabies	12,523	12,505	17,720	18,586	—	61,335
15. Ante-Natal	66,677	23,844	51,148	66,532	—	2,08,201
16. Post-Natal	6,043	227	—	—	—	6,270
17. Baby	5,512	298	21,446	3,684	—	30,940
18. Gynaecological	22,008	12,200	327	25,331	—	59,866
19. Family Planning	5,752	646	5,283	—	—	11,681
20. Malnutrition	1,718	—	—	1,619	—	3,337
21. Eye	1,07,331	41,012	10,092	2,13,124	396	371,995
22. T. B.	4,18,012	51,966	41,953	—	2,08,810	7,20,741
23. Dental	**1,99,931**	**1,41,525**	**1,20,041**	**2,14,464**	**129**	**6,76,090**
24. Cancer	2,808	—	—	9,077	—	11,885
25. V. D.	—	—	—	62,982	1,37,865	2,00,847
26. Neuro-Psychiatric	660	—	—	10,969	3,346	14,975

From the Administration Report of the Director of Health Services for 1966-67 published in June, 1970.

With the Compliments

of

UNION CHEMISTS

460, UNION PLACE,

COLOMBO 2.

Phone: 92532

FLEET FASTNERS (Ceylon) Ltd.

ZIP FASTNERS

All Sizes, Lengths, Colours Guaranteed quality.

Wholesale enquiries Solicited.

SHEWAKRAMS - PETTAH

Phone: 25174 Colombo.

An Invitation

TO THE MEDICAL PROFESSION

We welcome inquiries from those in the noble profession from any part of the country about our most reliable brands of DRUGS, CHEMICALS, PATENT MEDICINES, SURGICAL DRESSINGS and APPLIANCES etc. from world renowned Sources.

Having catered to medical needs over the years, we offer a thoroughly dependable, careful and courteous Service.

V. P. P. ORDERS ARE SPECIALLY ATTENDED TO

from

CEYLON'S MOST POPULAR CENTRE

Pettah Pharmacy Ltd.

WHOLESALE-RETAIL DISPENSING CHEMISTS.

23, DAM ST., COLOMBO, 12.

Printed at the Union Press Colombo