

ORAL HEALTH CENTRE KUMASI

A design thesis report presented to the department of Architecture, faculty of Environmental and development studies, University of science and technology Kumasi in partial fulfilment of the requirements for the Post-graduate Diploma in Architecture

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KUMASI-GHANA

By

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July 1998

DEDICATION

This design has been dedicated to my loving mother whose selfless, enduring character has brought me this far.

INTRODUCTION

AN ORAL HEALTH CENTRE IS A CENTRE WHERE SERVICES ARE PROVIDED FOR THE PREVENTION TREATMENT AND CURE OF DISEASES OF THE ORAL CAVITY AND THE LOWER ONE-THIRD PORTION OF THE HUMAN HEAD.

IT INCLUDES ALL ASPECTS OF DENTISTRY AND MAXILLOFACIAL SURGERY. SOME OF THE DISEASES ARE :

CAVITIES, GINGIVITIS,
PERIODONTIS, ORAL CANCERS
AND TUMOURS.

Objectives

- TO CATER FOR THE ORAL HEALTH NEEDS OF THE REGION AND THE NORTHERN SECTOR OF THE COUNTRY.
- TO OFFER CLINICAL EDUCATION FOR DENTISTRY STUDENTS WHO WILL BE TRAINED BY THE SCHOOL OF MEDICAL SCIENCES-UST.
- TO OFFER RESEARCH FACILITIES FOR DENTISTS AND POST-GRADUATE STUDENTS.



ORAL HEALTH CENTRE KATH-KUMASI

Boy appeals for support

By Graphic Reporter

AN 18-year boy, Alfred Annan has appealed to the public for support to undergo surgical operation at the Korle Bu Teaching Hospital.

Annan, who is suffering from a tumour, has had his mouth and jaws swollen and requires operation to restore them to normalcy.

Accompanied by one Mr Kyei Gyamfi, Annan who hails from Akwein Afosu in the Eastern Region, made the appeal through the Graphic in Accra.

Mr Gyamfi said, Annan should have been operated upon last year but due to financial problems he could not undergo treatment. Mr Gyamfi said the

situation is now worse but the parents are not capable of financing the operation and the boy to die in the village, before he decides to bring him to Accra to seek public support.

He, therefore, expressed the hope that the general public will support the boy to undergo the treatment.



• Alfred Annan

ACKNOWLEDGEMENT

"All things worketh together for good to them who are in the lord, to them who are called according to his purpose." Rom. 8 : 28.

I thank the Almighty God who has kept me under his loving arms till now. I also thank my parents Mr. And Mrs Richard Kwami for supporting me financially and morally, Mamaa, Cudjoe and Kafui for both moral and financial support and to my little nieces and nephews for all their prayers.

My sincerest gratitude also goes to the staff of the Dental School Korle-Bu for their moral support and the volume of information that was made available to me. Dr. Karikari, Dr. Nartey, Dr. Ishmeal Bruce Dr. Mrs Adadevoh, Dr Odonkor, Dr. Bankas

Dr. Oppong thank you very much. To the Administrator of K.A.T.H Mr. Asiedu Offei I say thank you; and to the Theatre staff I express my sincerest gratitude.

ABSTRACT

It has been estimated that 80% of the total Ghanaian population have some form of oral health need, be it in the form of hygiene, maintenance or treatment of dental or maxillofacial diseases. Knowledge of the maintenance of teeth is very low in Ghana and most cases that reach the dentist are in the destructive stage.

In Ghana, most oral diseases are preventable, however, the lack of education especially in the rural areas aggravates the situation. It is in this light that the Ministry of Health in its efforts to provide health for all by the year 2020, has proposed for all health institutions a certain level of service facilities related to the community they serve.

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INTRODUCTION

An Oral Health Centre is a centre where profilactic and therapeutic measures are taken in the care of Oral Health need of the people.

Oral diseases affect the mouth or Oral cavity and the lower one - third portion of the human head. In an Oral health centre, all aspects of maxillofacial surgery and dentistry are taken of.

OBJECTIVES

To offer health services to the population, both curative and preventive.

To offer research facilities for oral health workers.

To serve as a refferal centre for other health facilities especially in the northern sector of the country.

CLIENT

Ministry of Health, School of Medical Sciences U.S.T.

TARGET GROUP

The Kumasi Populace and the Northern Sector of the country.

FINANCIERS

The Financiers for this project are:

The Government of Ghana, St. Georges Teaching Hospital London, Unilever Group of Companies.

METHODOLOGY

Various methods were used to achieve my aim. The main ones were

Visual and audio means

Journals and Papers written by doctors.

Actual site measurements.

CONSTRAINTS AND LIMITATIONS

Some constraints and limitations/encountered some limitations as to site selection and financing.

JUSTIFICATION

Komfo Anokye and Korle-Bu are at the top of the hierarchy of the health service delivery in Ghana. Korle- Bu has a temporal dental School and a new one is being setup. Komfo Anokye has only dentistry clinics at the main Hospital and at the Polyclinic.

For a Regional and Teaching Hospital, it lacks the proper facilities to provide efficient service for the patients.

The Dentistry departments at the Komfo Anokye Hospital has dentists who treat at least 50 patients each day. This reduces the time spent on each case. When such a facility is in place.

The Oral health needs of the people would be met on a wider scale and preventive measures encouraged.

CHAPTER ONE

1.1 STATEMENT OF AIM

To create an oral health centre capable of providing a full range of dental services to the community as well as offering a comprehensive education for dental students surgeons, therapists, hygienists, technicians and nurses.

1.2 POLICY FOR CARRYING OUT THE AIM

1. Professional Standards:

The design should express and encourage the highest possible professional standards.

It follows that: the features of the existing environment must be critically appraised.

New concept of care, methods and tools of work must be vigorously explored.

UNITY OF SCHEME

The School of Medical Sciences U.S.T., The Komfo Anokye Teaching Hospital and the proposal oral health centre must be conceived as complementary parts of one whole.

ENVIRONMENT

The environment must be created which enables patients to be cared for with understanding and sympathy, gives them and their families reassurance.

TEACHING AND RESEARCH

Effective access and facilities must be provided for teaching and research in surroundings congenial and convenient to the users.

STAFF AND STUDENTS

Staff and students must be provided with facilities such as common rooms, accommodation conducive to the study and the study and to a full social life within the complex of Komfo Anokye Teaching Hospital.

CHANGE AND GROWTH

In planning, all foreseeable trends and developments must be carefully considered and change as well as growth must be distinguished and allowance made for both.

1.3 BASIC PRINCIPLES

Functional Unity

It is clear from the above that the Komfo Anokye Teaching Hospital and the Health centre form one whole. The function of dental teaching service and research are so closely related that one cannot identify many of the areas in the to be entity as serving only one of these functions.

1.4 SCOPE

Assessment of Scale

The statement of aim above establishes that the Oral Health Centre will be for Teaching, Treatment and Research. In addition, there will be a restructuring of parts of Komfo Anokye Teaching Hospital to adequately cater for the introduction of a new facility.

CHAPTER TWO

2.1 HISTORICAL BACKGROUND

TEETH

Teeth have existed for hundreds of millions of years. For thousands of years, teeth have stood as one of the most durable records of individual lives.

In the mouth, teeth are used for chewing. When removed, teeth have performed a wide variety of cultural roles throughout human history. They have been used as currency and as symbols for beauty and as decorative jewellery.

MAINTENANCE OF TEETH IN GHANA

In Ghana, wooden sticks are made either from the roots, stem or bark of local trees and shrubs. These are stripped to convenient sizes and used.

The chewing sponge, another form of tooth brush is made from root, softened by soaking in water for about a day, then beaten to separate the fibrils into sponge-like bulk. A

mouthful is removed from the bulk, chewed initially to soften it even further, then diligently rubbed against tooth surfaces.

The type of plant used differs, from one geographical locality to another and thus there are many botanical varieties of chewing sticks. The choice of a particular stick is guided by its availability and taste. The taste range from mildly bitter to the bitter, from bland to hot and a peppery taste.

In all regions, mouth cleaning is done in the morning, several times a day or continuously throughout the day often increase the deterative or stain removal properties.

Among muslims, the 'sunna' states that before prayers, an individual should go through a cleansing process which includes the cleansing of the mouth by the use of the chewing stick.

A few of the commonly used plants are:

O. rogo (*Garcina kola*) Tweapea.

Ewuro (*Veronia Amygdalina*) Sawei

Neem, Hibiscus, coconut husk,

Betelnut husk, Guava twigs.

In the Wassa West district, the head of plantain and charcoal are ground together and used for cleaning teeth.

Cola, used in mostly the northern part of the country usually for traditional practices, has some chemical which aids in preserving teeth. However it stains the teeth and if the mouth is not washed properly particles stay impacted in crevices and cause diseases.

Festooning with file like objects are not only for pride and beauty but also to help shear tough fibrous meat.

The toothpaste and brush have now become widely used especially in urban areas. With a fluoride base, it is the best method of oral hygiene. Its effective use however is not well known.

Studies show that if these traditional methods are used properly they can be as effective as the toothpaste and tooth brush.

2.2 ORAL HEALTH ISSUES

Nothing could be more lifeless-looking than a tooth. And yet despite appearances, teeth are living organisms. They receive nourishment and grow and repair themselves. The enamel surface we see in our mouths, is actually only substance in a vertebrate body. It is 95% inorganic, composed of crystals which are mainly calcium and identical material called Dentin. Like bone, dentine is a mix of 70% inorganic material and 30% proteins and water. One of its primary functions is to absorb the shock of biting. It also houses the tooth's cells, arteries, veins and nerves linked to the rest of the tooth. Blood brings minerals and cells produce proteins help dentin in a mature tooth retain its structural integrity and respond to injury.

TEETH - ROCKS IN YOUR HEAD

A tooth's shape, chemical composition and the scars it bears from use help scientists explore questions as diverse and unexpected as what triggers changes in the earth's climate what our early ancestors ate for dinner.

Individual human teeth are as carefully designed as carpentary tools: blade-shaped front teeth for biting, fanglike canines for grasping, premolars for crushing and larger molars for grinding.

Canivores and Herbivores have their specialized dental features to help them shear flesh and grind plants.

SOME FACTS ABOUT TEETH

While the back teeth of tyrannosaurus could withstand 1,360 kilograms of biting pressure, human teeth can withstand just 45 kilograms.

Teeth have stood as one of the most durable and meaningful records of individual lives.

Teeth are as strong as granite and weak as putty. They may outlive us by thousands of years yet are apt to rot while we sleep.

Human enamel is manufactured at a temperature of 37°C . A synthetic equivalent must be forged at a temperature of 1,200 degrees.

2.3 DISEASES OF THE ORAL CAVITY

Tooth decay results from a chemical reaction between oral bacteria and food debris that remains in your mouth after eating. The bacteria which make up a sticky invisible film called plaque, react with sugars and starches in foods to produce an acid capable of dissolving tooth enamel by robbing it of minerals -

Demineralization. Cavities occurs when demineralization occurs faster than remineralization.

Cancers and other oral and maxillofacial diseases constitute a real threat to the general health of Ghanaians.

These have defiguring effects. Some are:

Burkitts Lymphoma - This is confined almost exclusively to children. It makes 50% of all malignant tumours in children.

Ameloblastoma of the jaws

Fibrous - osseous lesions

Osteomyelitis

Chewing tobacco can cause numerous problems. There is a higher risk of developing oral cancer, long time users have 50 times greater risk of developing cancers of the lower lip area and gums. When not caught in time, surgery may be required. In some cases oral cancer causes death. Gums that are irritated by tobacco can turn whiter and pulled away from teeth leaving roots exposed to bacteria and more prone to decay.

Healthy gums are firm and do not bleed. Tiny fibres hold teeth tightly to the gums and underlying bone.

The gums fit snugly around the teeth so plaque can be removed from below the gumline only by flossing and professional cleanings.

The early stage of gum disease is Gingivitis, a mild inflammation of the gums have become red and puffy and may bleed during brushing or flossing. The bone and fibres holding the tooth in place are unaffected at this stage, so damage can be reversed.

At this stage, plaque has moved deeper along the tooth and started an infection that has damaged the bone and fibres supporting the tooth. The gums may separate from the tooth and start to recede. A pocket has formed below the gumline that traps plaque and food debris, perhaps causing persistent bad breath. Treatment can stop further damage.

In advanced periodontitis, plaque caused infection has destroyed more than half of the bone and fibres holding the tooth in place. The gums have receded and separated from the tooth and may be painful.

The tooth may shift or loosen, and the bite may change. If treatment cannot save the tooth, it may have to be removed and replaced to prevent further damage.

2.4 GLOBAL ISSUES

Treatment of decayed teeth forms a great proportion of work done by the dentist, to reduce or eliminate dental decay calls for a radical food and dietary policy. The aim of the food policy would be to keep consumption levels of added sugars such as sucrose and glucose to less than 10 kilograms per person per year - a level of sugar at which little decay occurs. In developed countries the consumption of sugar is high and is rapidly increasing in developing countries.

In the past, dental care was not given sufficient attention in advanced developed countries especially the preventive aspect of dental care especially the preventive aspect of dental care.

Today, with increase in knowledge of dental problems and awareness through oral health education, more and more people are responding to dental health care.

On the other hand in developing countries where traditional method of preventing dental decay were popular, the upsurge in the consumption of sugar and the decline in the adoption of preventive measures, together with the high cost of modern dental care i.e cost of toothpaste and fluoridation of drinking water have been combined to aggravate the problem of dental decay.

It is generally an accepted fact that dental problems are more prevalent in the developed countries than the developing ones.

The Pattern of dental problems prevailing in developed and developing countries are shown in the following graphs:

In developing countries adults and the elderly have a low level of dental diseases with only few decayed or missing teeth which enables them to retain a functioning set of teeth throughout their lifetime. Over the last 10-20 years, caries have been increasing in children who constitute a very substantial proportion of the population.

In developed countries, a significant proportion of adults and the elderly have lost their teeth.

Those remaining have fillings or prostheses. The disease level among children and adolescent are declining in some developed countries, reaching as low or even lower than

in developing countries. This reduction is due to effective preventive programme, however, this is not the case with the developing countries.

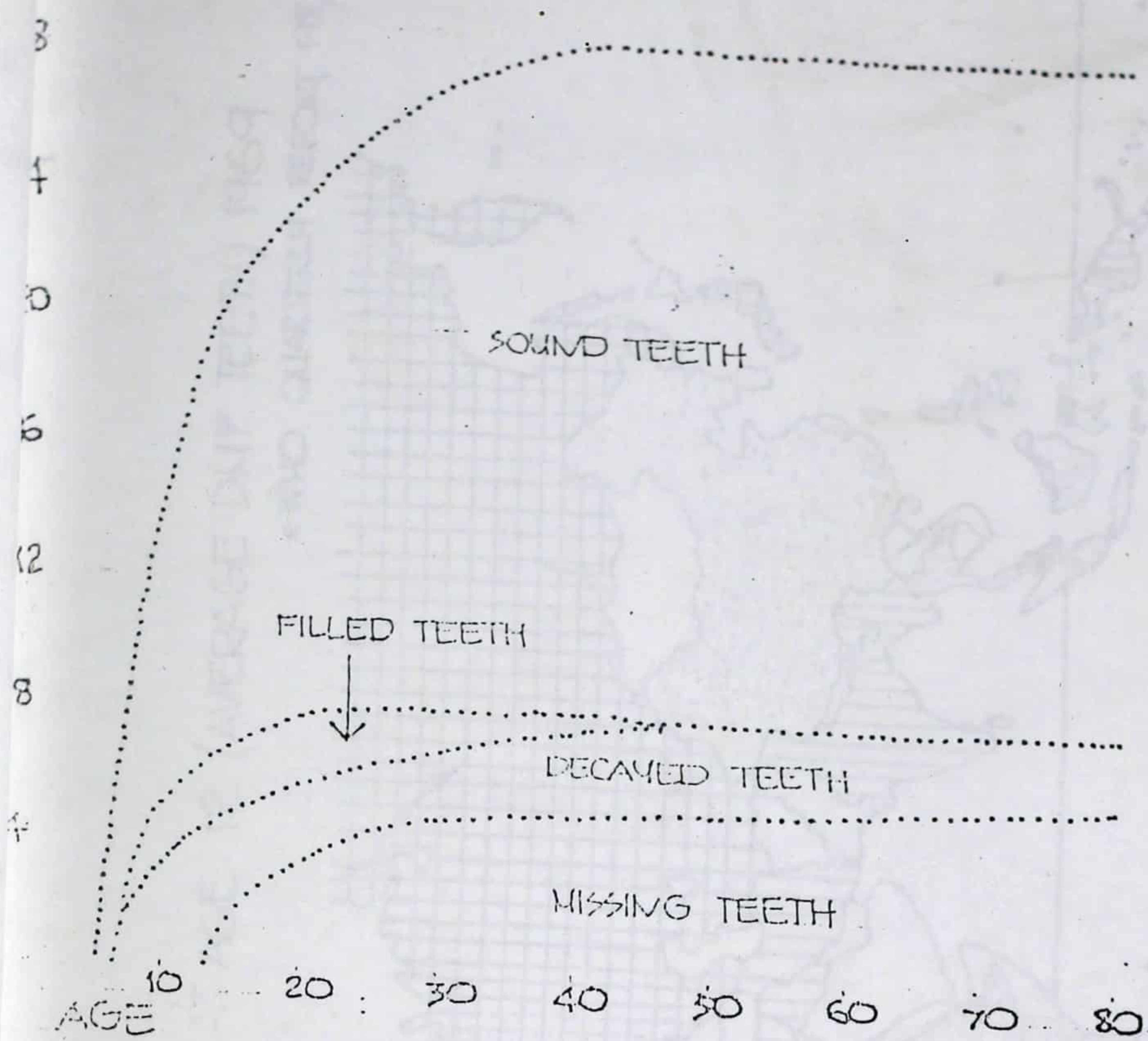
The following statement headed a report to the 36th World Health Assembly in 1983 "More tooth Decay in Third World than in Industrialised countries" for the first time over in 1982 more people in the developing countries were victims of tooth aches than those in the developed countries.

So another disease which was common in Industrialised countries are rare in Africa has been developed.

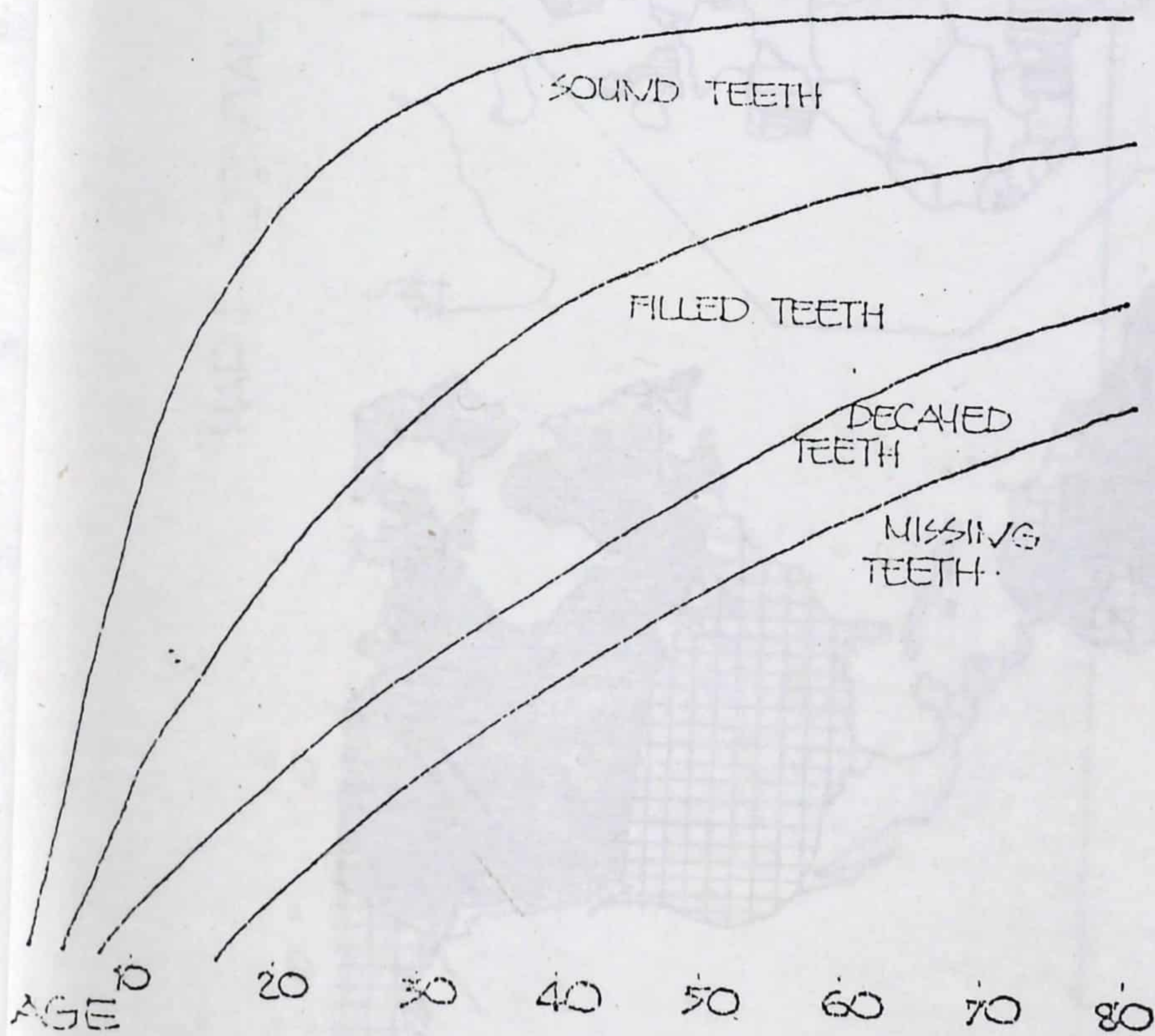
The problems is compounded by the fact that there is inadequate oral health personnel in these developing countries. The importance attached to dental care personnel.

According to WHO statistics there is an increasing trend in the training of dental health personnel in the developed countries.

In the case of the developing countries, although that have been attempts to train more, the results have not been too significant and this is reflected in low level of dental manpower in these regions.

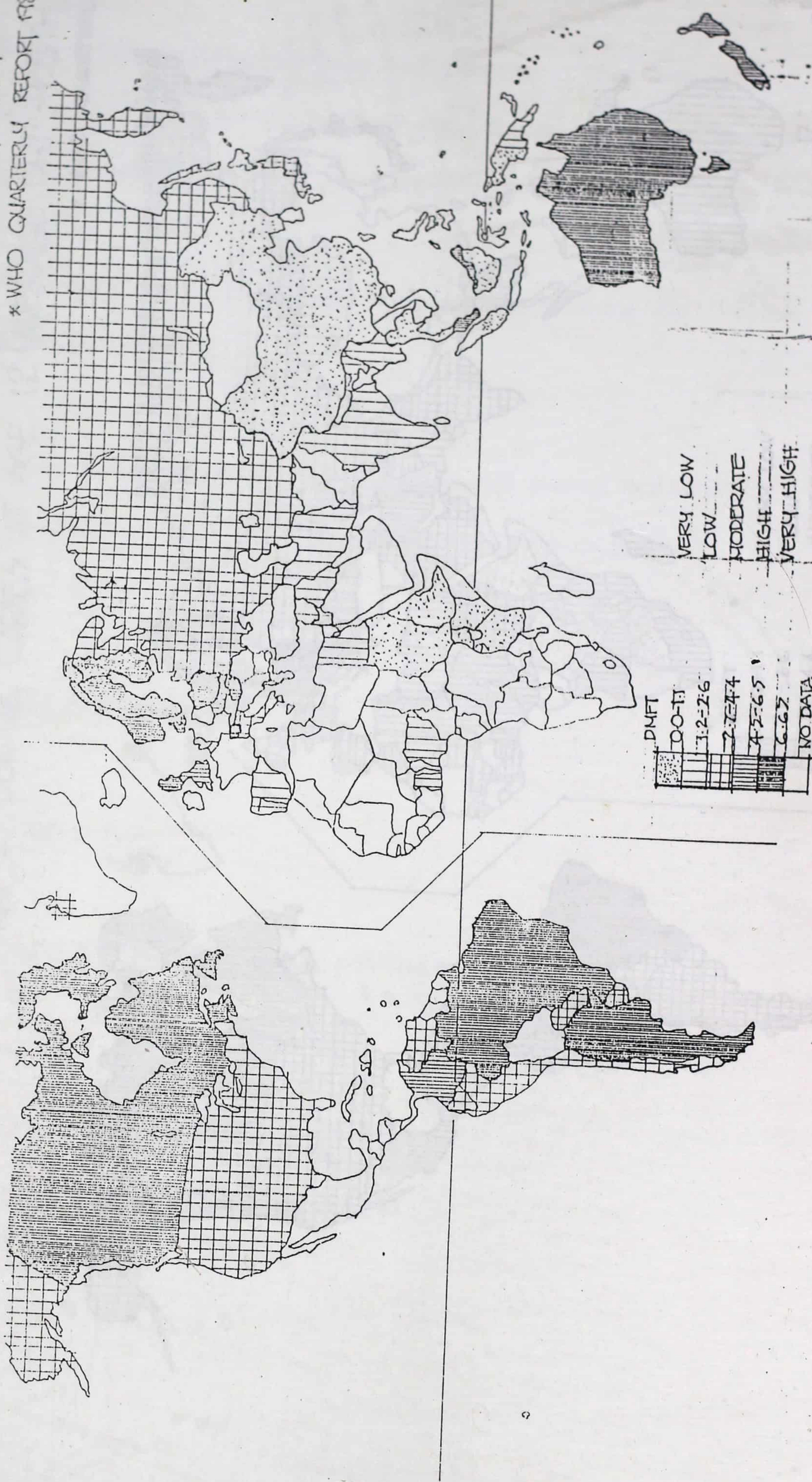


DEVELOPED COUNTRIES



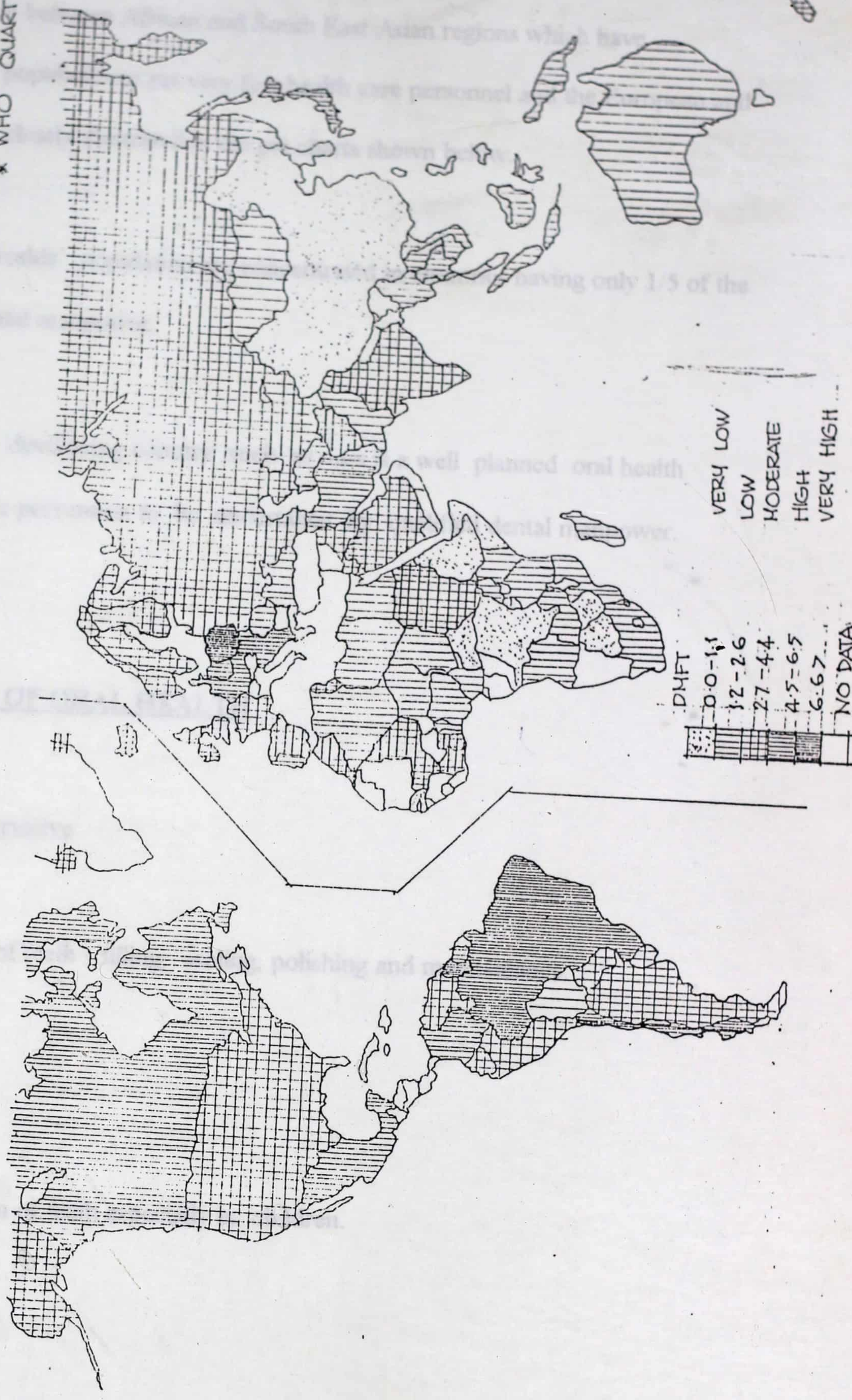
MAP 1 DENTAL CARE AT AGE 12 (AVERAGE DMF TEETH) 1969

* WHO QUARTERLY REPORT



MAP 2 DENTAL CARIES AT AGE 12 (AVERAGE DMF TEETH)

* WHO QUARTERS



The gross imbalance between African and South East Asian regions which have comparatively large populations yet very few health care personnel and the European and American regions is clearly illustrated in the pie charts shown below.

Indeed over 2/3 of world's population are concentrated in countries having only 1/5 of the world's qualified dental manpower.

What is needed in a developing country such as ours is a well planned oral health promotion and disease prevention to be undertaken by qualified dental manpower.

2.5 BRANCHES OF ORAL HEALTH

Restoration and Conservative

Deals with restoration of teeth - filling, scaling, polishing and maintenance.

Periodontic

Deals with malformation of teeth especially in children.

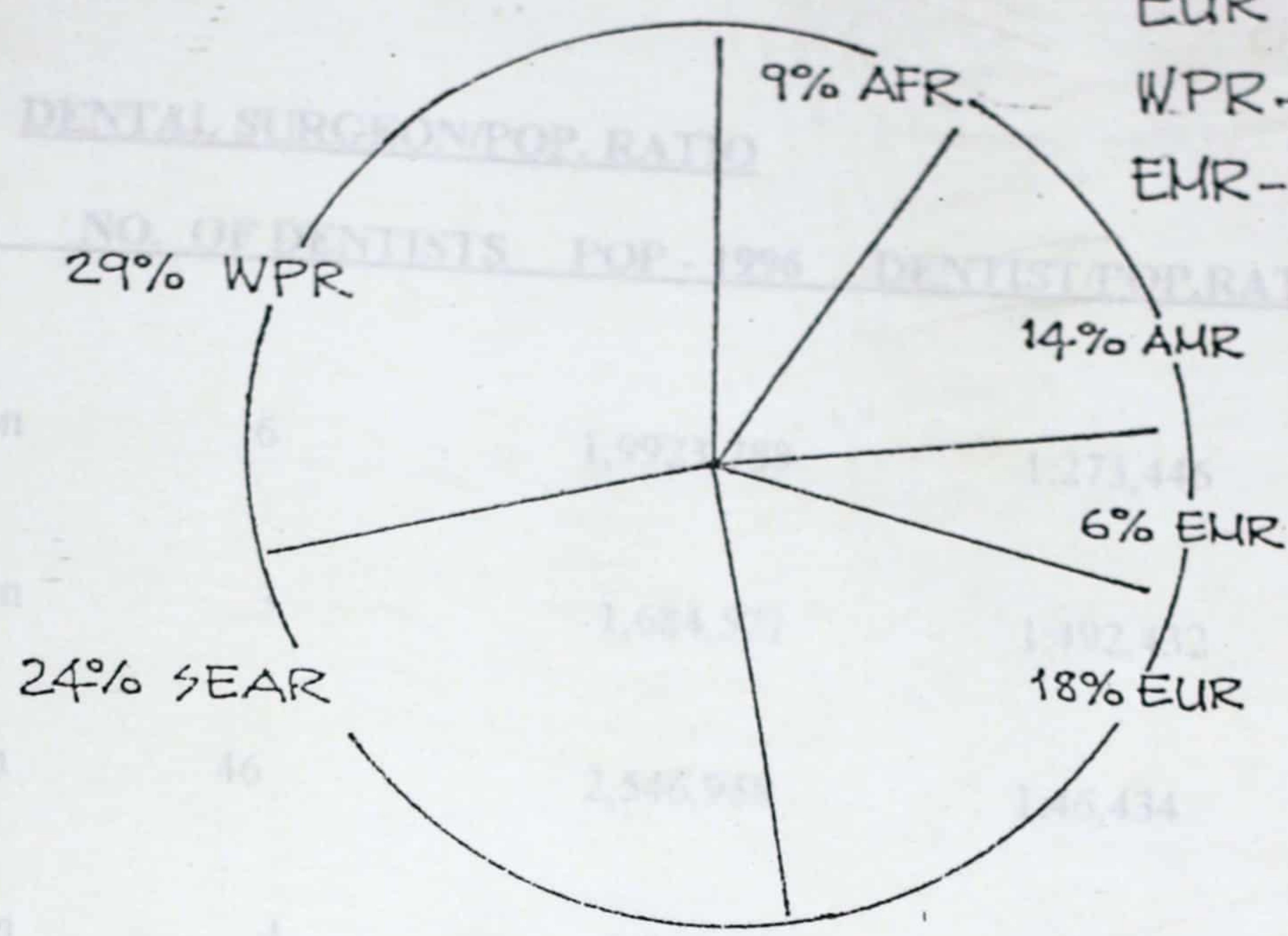
Paedodontic

Deals with the care of children

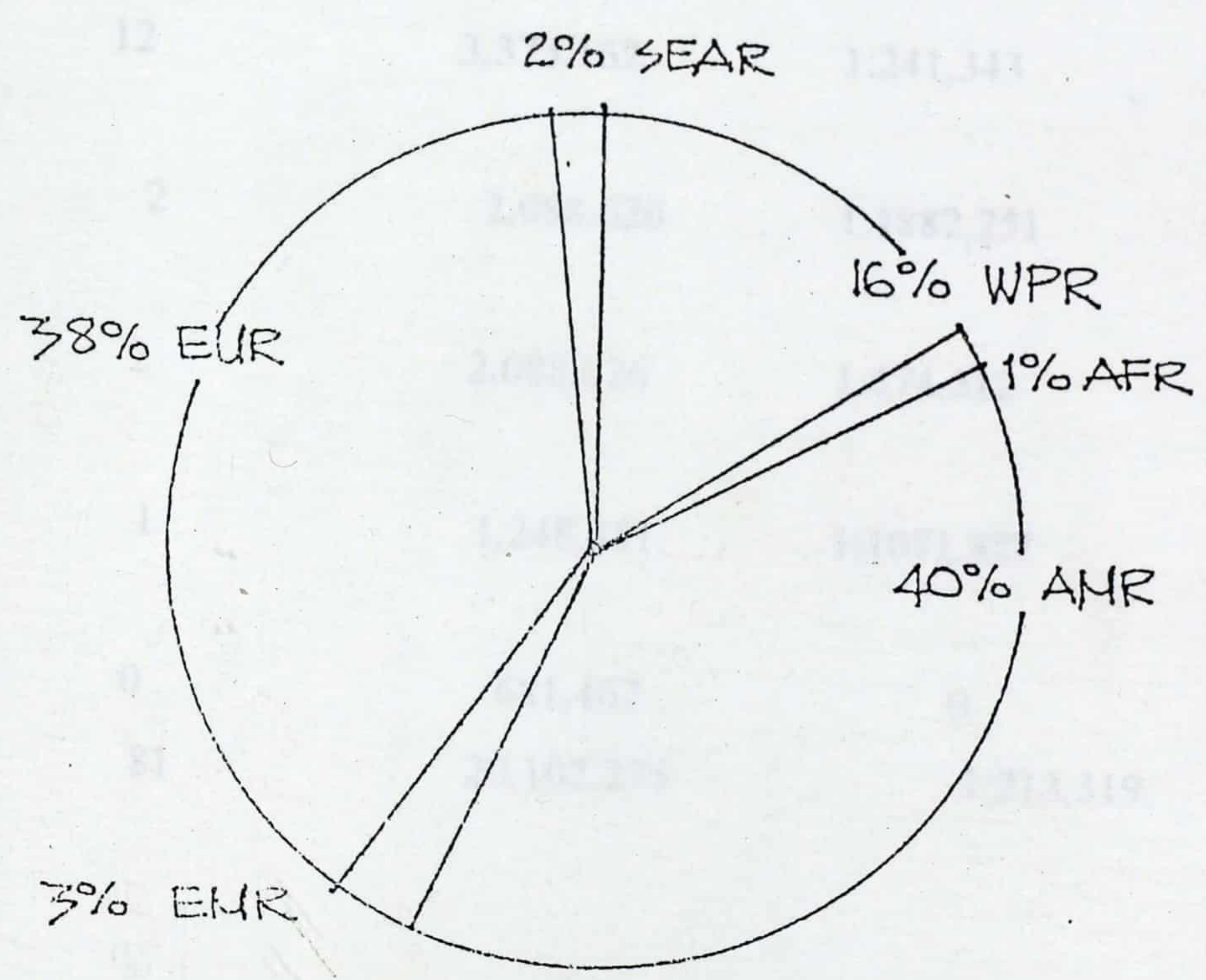
Oral Surgery

Deals with tumours, maxillofacial and accident cases.

SEAR - S.E. ASIA REG
 EUR - EUROPE
 WPR - WEST PACIFIC
 EMR - MIDDLE EAST



POPULATION DISTRIBUTION



DENTAL MANPOWER

DENTAL MANPOWER AND POPULATION DISTRIBUTION

SOURCE : WORLD HEALTH STATISTICS 1986

2.6

DENTAL SURGEON/POP. RATIO

<u>REGION</u>	<u>NO. OF DENTISTS</u>	<u>POP - 1996</u>	<u>DENTIST/POP.RATIO</u>
Western Region	6	1,9923,788	1:273,446
Central Region	3	1,684,571	1:492,432
Greater Region	46	2,546,958	1:46,434
Volta Region	4	1,813,225	1:395,981
Eastern Region	5	2,653,499	1:4557,807
Ashanti Region	12	3,373,162	1:241,343
Brong Ahafo Region	2	2,088,626	1:1882,251
Northern Region	2	2,088,626	1:874,512
Upper Region	1	1,248,351	1;1071,427
Upper East Region	0	681,467	0
TOTAL	81	20,102,275	1:213,319.

W.H.O. Recommended figure - - -1:80, 000 - 120,000.

2.7

FUNCTIONAL STATUS OF DENTAL UNITS

	FUNCTIONAL	NON--
FUNCTIONAL		
REGIONAL HOSPITAL	20	15
DISTRICT HOSPITALS	10	4
SCHOOL DENTAL CLINICS	-	5
MISSION	2	-
TOTAL	32	24

CHAPTER THREE

3.1 STRATEGIES FOR MEDIUM TERM

GOAL -

To improve the coverage and services to the general population.

STRATEGIES-

Decentralizing the central outreach programmes strategic physical location of new oral health facilities to make services more accessible to rural communities.

Equipping old and new facilities and designing a proper maintenance programme.

Establish training programmes for middle level oral health personnel who will man district facilities and reduce load from dental offices in the urban areas by carrying out simple procedures eg. Screening, examination, scaling and oral health education.

Train more dental officers and specialists in various disciplines of dentistry.

Conduct Technical and management training for existing dental offices programme managers.

Develop a data management system and research capability for the oral health programme.

To improve monitoring and evaluation of oral health programme.

To improve monitoring and evaluation of oral health programmes.

Impress on M.O.H the importance of increasing Budgetary allocation on proposals of this document.

Framework: This goal will be achieved within the following policy framework:-

broad policy- to provide optimum level of oral health for all people resident in Ghana.

Coverage- All districts should have an acceptable oral health package. Outreach dental services would be provided to population with no easy access to dental clinics..

services- To provide curative, preventive, rehabilitative and promotive services at the national, regional and district levels.

To provide an efficient referral system to cater for the services above. To strengthen intergration with the school health programme.

Manpower- All dental clinics in Regions and districts should be staffed by dental officers with a support team with pscibeal training.

Training- training of dental workers should be locally based, There should be continuing education for all dental staff (technical and management). Non-dental personnel should be trained in preventive and promotive services. Continued education should be an intergral part of it.

Equipment and supplies- all clinics must have standardized set of equipment, instruments and supplies. Preventive maintenance for all clinics. Classified items should be procured centrally, others decentralised form of procurement.

Collaboration with private sector- public sector would continue to collaborate with private sector in areas of equipment, supplies and continuing education.

Traditional methods- traditional methods of cleansing which is the main means of good oral hygeine should be promoted.

Services management- should be manned at national level- by chief dental officer, regional-regional dental health advisor, district-district health advisor.

Research - a comprehensive health survey would be done on diseases and effectiveness of programme.

3.2 SERVICE PACKAGE, PERSONNEL AND EQUIPMENT BY LEVEL

A laid out service package was planned to successfully execute the service delivery

LEVEL OF FACULTY- Health Centre Level

LEVEL OF SERVICE- Dental health education

Oral examination

Diagnosis of common oral diseases

Temporary restoration

Relief of pain

Refferal

Oral health promotion

Simple restorations and extractions.

PERSONNEL

Community health workers. Eg. D.N.N

medical assistants, school teachers, N.G.O.'s

Dental assistants/therapists

Visiting dental surgeon.

EQUIPMENT AND INSTRUMENTS

Simple portable dental chair.

Dental stool

Basic set of hand instruments

Sterilizer

Mobile compressor.

LEVEL OF FACULTY

District Level (district hospital)

LEVEL OF SERVICE

All services sub-district level plus

provision of permanent restoration

radiology

minor oral surgery.

Dental extractions

simple crowns and bridge

periodental treatment

treatment of jaw fractures

paedodontics

dentures

referral

research.

PERSONNEL

All level of personnel at sub district level plus.

Resident dental officers.

Dental technologists (resident).

EQUIPMENT AND INSTRUMENTS

All equipment and instruments provided at sub-district level plus complex dental unit and accessories.

X'ray Unit and developer

Surgical instruments

Dental laboratories equipment.

LEVEL OF FACULTY-

Regional level (regional dental clinics, at hospitals and polyclinics

LEVEL OF SERVICE-

All services at sub district and district level plus
major oral surgery
orthodontics
crown and bridgework
advanced periodontal treatment.

LEVEL OF PERSONNEL

All levels at sub district and district plus
specialist in various disciplines in dentistry.

Dental equipment technician.

EQUIPMENT AND INSTRUMENTS

All equipment and instruments at sub
district and district level plus.

O.P.G. Equipement facility

equipment for porcelain and crown and
bridge.

LEVEL OF FACILITY NATIONAL LEVEL

(Clinical dental school)

LEVEL OF SERVICE

All services at the subsidiary levels plus.

Teaching and research

LEVEL OF PERSONNEL

All personnel at subsidiary level

plus

Senior staff and junior staff.

EQUIPMENT AND INSTRUMNETS

Best of the range.

CHAPTER FOUR

4.1 JUSTIFICATION - WHY KUMASI ?

Location Of Kumasi In The National Context.

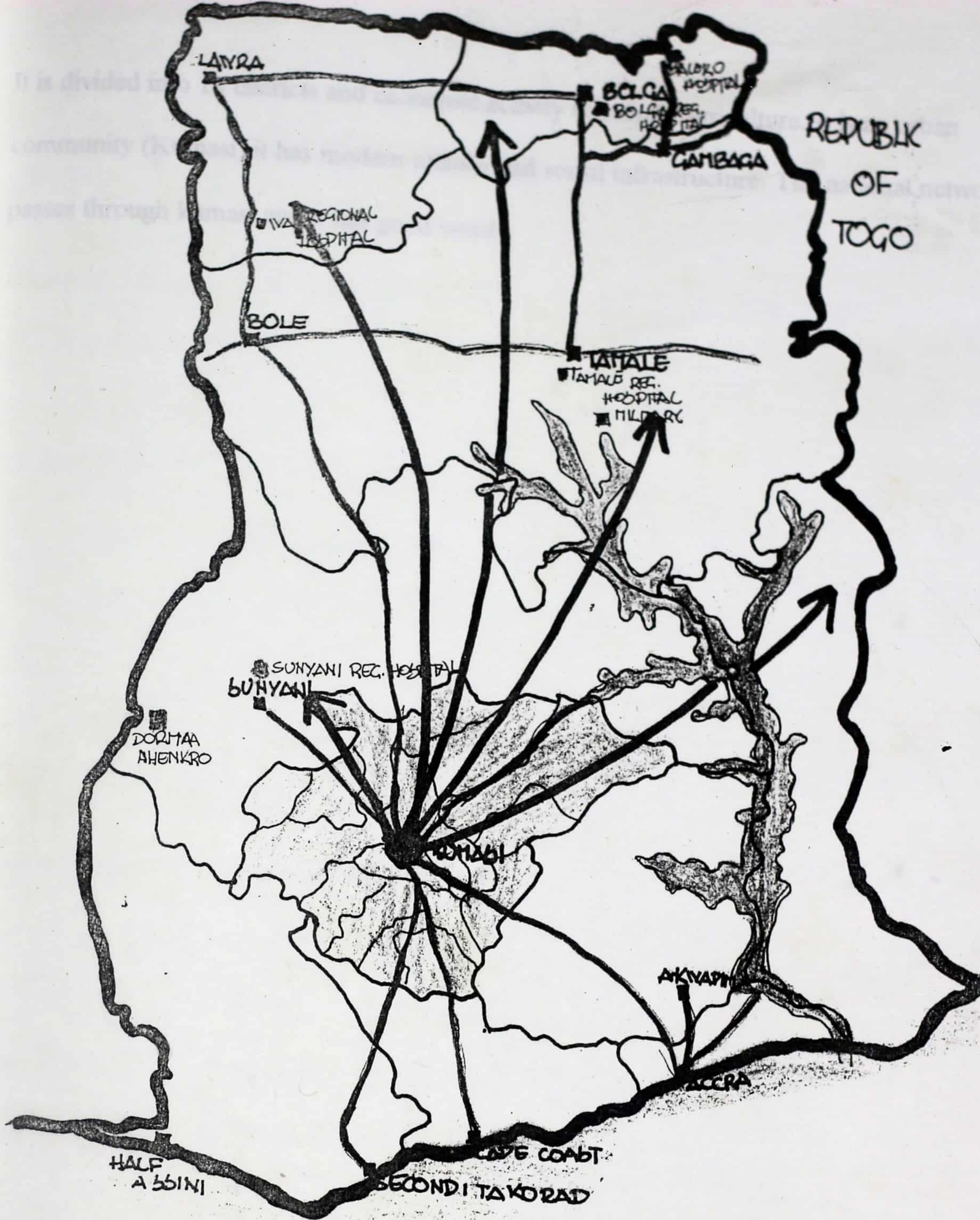
The map of Ghana shows the location of Accra and Kumasi and indicates the extent to which each central Hospital serves the nation.

Kumasi, the Ashanti Regional Capital, is the second largest city of Ghana. The city is strategically and centrally located and to command major commercial, Administrative and cultural spectrum in the national and most African context.

There are all indications that the city will be opened up even more with the proposed La Cote D'Ivoire Porte at Fumesua to attract Residents and visitors alike.

The Ashanti Region measures 24, 389 sq. Km. It is bounded on the North by Brong Ahafo, West by part of Brong Ahafo and Western Regions, east by Eastern Region, South by Central Region.

The Region lies in the forest belt of Ghana.



It is divided into 18 districts and economic activity is mainly Agriculture. It is an urban community (Kumasi) it has modern utilities and social infrastructure. The national network passes through kumasi and it has good words.

4.2 DISTRIBUTION OF DENTAL CLINICS IN NORTHERN SECTOR

<u>REGION</u>	<u>NAME OF HOSPITAL</u>	<u>NO. OF SURGERIES</u>	<u>NO. OF SURGEONS</u>
ASHANTI	K.A.T.H.	5	7
	SUNTRESO H.C.	1	1
	ASANTE MAMPONG	1	1
	DIST. HOSP. JUASO	1	0
BRONG AHAFO	SUNYANI REG. HOSP.	2	2
	DORMAA AHENKRO	1	0
NORTHERN	TAMALE REG. HOSP.	1	1
	MILITARY CLINIC	1	0
UPPER EAST	BOLGA REG. HOSP.	1	1
	BAWKU HOSP.	1	0
UPPER WEST	WA. REG. HOSP.	1	0

4.3 ORAL HEALTH SITUATION IN KUMASI (ASHANTI REGION)

Good Oral health is an important component of the total well being of the population; however its promotion leaves much to be desired.

A study by Dr. S.A. Amoateng at Komfo Anokye Teaching Hospital revealed that oral diseases at K.A.T.H in 1985 & 1986 accounted for 4.4% and 4.7% respectively for the total disease presentation and was the 4th highest in terms of morbiidity and was the U.R.T.I, and diarrhoea diseases preceeding it).

A study of the records at K.A.T.H for the years 1992-1996 reveals the following :

	1992	1993	1995	1994	1996
Extractions %	83.05	79.38	81.96	79.32	79.28
Restorative %	9.49	12.54	9.13	12.3	9.79
Prosthodontic%	2.8	2.33	2.22	2.96	3.09
Maxillo-F/Minor oral surgery%	3.91	5.03	5.51	4.31	6.81
Preventive	0.66	0.67	1.09	0.99	0.98
Others (mainly denture repairs)	0.11	0.06	0.1	0.13	0.08
Attendances	18985	21212	21189	25473	26267
Total Procedures	11820	12239	12117	15595	16368

The low figures for Preventive and Restorative procedures and the high figures for extractions may imply that;

- 1) The patients wait for long periods before seeking help.
- 2) They might not know that their teeth can be restored.
- 3) They might not be aware of the preventive procedures available and the need to go in for check ups.
- 4) The available facilities may not be adequate in taking care of the cases.
- 5) The Practitioners may not be having the right skills.

CHAPTER FIVE

PREVIEW OF KOMFO ANOKYE TEACHING HOSPITAL

5.1 KATH IN THE NATIONAL HEALTH DEVELOPMENT FRAMEWORK:

Komfo Anokye and Korle bu, respectfully occupy the apex of the national health delivery system as shown below. Both deal in referral cases.

	KOMFO	CENTRAL	KORLE-BU	
80%	ANOKYE	HOSPITAL	ACCRA	20%
	KUMASI			

REGIONAL HOSPITAL

DISTRICT HOSPITAL

HEALTH CENTRES

HEALTH POSTS

Komfo Anokye is a referral central for Brong-Ahafo, Northern Regions, Part of Volta, Eastern, Central and Western Regions.

5.2 Historical Background

Komfo Anokye Hospital is in Kumasi, the Capital of the Ashanti Region. It is situated at Bantama, a suburb of Kumasi and is about 2km north west of Kedjetia. The City Centre. It covers a total land area of approximately 21 Ha.

It is located on a hill, the site where the legendary fetish priest of Ashanti, Okomfo Anokye planted a mysterious sword which remains stuck in the soil till this day. It is bordered on the east by the main Bantama-Kedjetia dual carriage way, on the south and west on the north by the Bantama township.

5.3 COMPONENTS OF KATH

The Hospital complex is divided into 4 blocks, A, B, C, D. Each comprises 5 wards except for C with 6 wards. It has a large Polyclinic attached to the Hospital, located at the accident centre.

There are five departments divided into 3 major branches. - medical, paramedical and supportive services.

No. of beds - 17,000

5.4 ARCHITECTURAL COMPOSITION OF K.A.T.H

K.A.T.H is made up of multi-storey Buildings are linked up at each floor making Pedestrian traffic between buildings easy. Roofed concrete walkways connect the Polyclinic to the main Hospital Buildings materials used are concrete, reinforced concrete locally made solid concrete blocks, wood, corrugated asbestos sheeting. The building keeps with local climatic requirements in having provisions for the exclusion of direct sun - wide eaves, louvres and other sun shading devices for easy through ventilation for cross ventilation and screening for insects on windows, doors, vents and verandahs.

It is served by an 11/0.4 KV distributor transformer station. There are 3 no. 732KVA transformers.

5.5 EXISTING SITUATION IN K.A.T.H.

Main Hospital

Observations:- Has three (3) functional surgeries and one non-functional one.

- Has storage cupboards for linen and worktop for equipment
- Well equipped surgeries and one large prosthetics laboratory
- Has 3 dentists including one maxillofacial surgeon
- Has 3 dental assistants, 1 technologist, 1 laboratory assistant
- Sees to an average of 50 - 75 patients a day

Merits

- Adequately equipped surgeries with up to date technology
- partitioned surgeries allow for proper servicing
- well ventilated surgeries
- common office for doctors have been provided
- surgeries one close to prosthetics laboratory for effective work
- fully equipped large prosthetics laboratory (10m x 6m)
- close to out Patients, Department

demerits:

- Corridor doubles as waiting area thus reducing passageway.
- Renewal collection is done on the corridor further reducing the space
- Surgery space with non - functional dental chair is used as waiting area.
- Records point is in the middle of thoroughfare thus creating human traffic at that point between patients, dentists and staff.
- Surgery spaces are small (2.4m x 3m) just adequate for one dentist and one assistant. So there is not enough space for escorts.
- No provision has been made for child care
- Distance between clinic and theatre is for emergency cases
- 3 dental chairs cannot fully cater for 50 patients a day
- One prosthetic technologist work load is too much and appliances are always obtained at a later date
- Storage for dentures and moulds are inadequate thus they are placed in a crowded cupboard.
- No proper piping of services and gas cylinder sits in the laboratory

- No extractor fans for dust created from polishing

5.6 POLYCLINIC

Observation:- Has a properly demarcated waiting area away from the corridor (12m x 6m)

Has 3 surgeons including one maxillofacial surgeon.

- Has 2 surgeries
- Has 1 prosthetic laboratory
- Has 1 lab technologist and 1 assistant
- Has 3 dental assistants
- Sees to 75 - 120 patients a day
- Close to radiology clinic for X-rays
- Close to accident and emergency centre for emergencies

merits:-

- Due to the ratio of dentist/patient in the Hospital, even though this waiting area is large enough to cater for the number of patients daily, time spent on one patient is about 20 - 30 minutes, 10 patients will have to wait in the corridor thus obstructing traffic.
- Prosthetic laboratory has only 2 windows thus lighting levels are low for precision work.
- Prosthetics laboratory is small (4 x 6m) as compared to main clinic so it cannot be as fully equipped to do a wider range of work even though it sets to more

patients than the main clinic does. Work therefore has to be transferred to the main clinic to be done.

- There is poor ventilation and lighting levels are low for work. This is due to few windows on the exterior walls.
- There are no offices or common rooms for staff

Conclusion

Adequate provision should be made for patients needs. Proper positioning of facilities helps in servicing

Provision for doctors needs are important for an effective work done.

CHAPTER SIX

6.0 SPECIAL STUDY

The clinical area of an oral health centre may be classified under four broad categories:

The Diagnostic Clinic

The Radiology Clinic

The General Clinic

The Special Clinics.

It is in the diagnostic and radiology clinics that the incoming patients need for dental care is determined and a plan of treatment is formulated.

6.1 THE DIAGNOSTIC CLINIC

Essential facilities in the diagnostic clinic include operatories or examination rooms, a clinical diagnostic laboratory and a treatment planning and consultation room. A clinical

diagnostic laboratory is used for haematological and other diagnostic procedures. Air gas and electricity are needed at each position of the work benches.

6.2 THE RADIOLOGY CLINIC

Because roentgenograms are made for every incoming patient, the radiology clinic is included in the diagnostic area. However, the radiology clinic also serves all other clinics and patients under-going treatment are directed here for additional rocentgenograms.

6.3 THE GENERAL CLINIC

The General Clinic is typically the busiest of all the clinics, Treatment components include operatories, treatment olanning and consultation rooms, supply and dispensing services and sterilisation and sterile supply facilities. The operatories or work stations into which all the clinics are divided consist of dental chairs and units, instruments cabinenmts and other necessary equipment.

Each station should be large enough to accommodate the patient, the student who is treating him, the supervising instructor and frequently a dental assistant.

6.4 THE SPECIAL CLINICS

- a) Periodentic - endodontic - a specialised aspect of conservation.

Conservation - preservation of the teeth

Orthodontic correction of dental deformities in children.

They are differentiated by primarily by the type of treatment needed. The same departmental facilities required in the general clinic are needed for each of the special clinics. Specific requirements; Except for some variations in the design of the instrument cabinets, the basic equipment of the special clinics are equipped with a standard dental chairs and units. The paedodontic clinic however requires a smaller chair and the oral surgery clinic need special chairs. Clinics where general anaesthesia is administered must have recovery rooms.

The prosthetic clinic has a ceramic laboratory.

The Orthodontic clinic requires, a measure room a record room a tracing room with a light table for routine tracing, an office for technical personnel and a sound proofed surgery.

Detail study of some of the spaces of the hospital will be tackled to give insight into the operations of a Dental Teaching Hospital.

6.5 SPECIAL SPATIAL STUDIES

Studies have been made on some of the special equipment and facilities which affect the utilisation and organisation of spaces in the Dental Teaching Hospital.

.6 DENTAL SURGERY SPACES

The study of the dental surgery spaces is to describe space requirements, give dimensions of major items of equipment ideal and environmental conditions working activities and examples of surgery planning.

GENERAL

Dental surgeries may be considered to comprise three main user zones. These correspond with the activities of dental surgeon, patient and chairside assistant. The centre around the dental chair depend very largely on the mode of operation practised by the surgeon or surgeons who are going to use the surgery. The three zones with their approximate minimum dimensions are illustrated in figure that follow

PATIENT ZONE

In the patients zone all that is needed is access from the surgery entrance door or if patients are interviewed at a desk, from the desk. Their role while in the chair is mainly passive but in most surgeries they need access to the spittoon attached to the unit.

DENTAL SURGEONS OPERATING ZONE 2 and 3 concentrates on the patients head but to include area within which he may reach out for instruments.

6.7 DENTAL CHAIRS

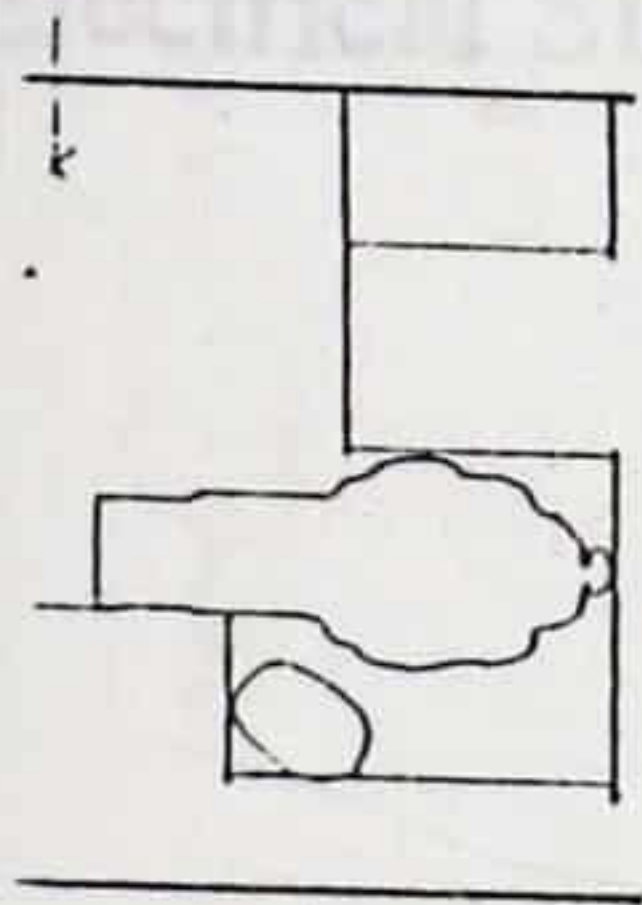
Location of dental chairs in dental surgeries must conform to certain limiting dimensions both as regards space around and relative to equipment such as the dental unit. If the latter is fixed, dimensions are critical but vary with different makes of chair, types of chair and type unit. This is because plumbing and other service outlets from the floor have to be connected and also to provide adequate working space around the chair. Dental chairs are designed so that many changes in position of patients can be made by the surgeon using foot pedals, switches and so on.

6.8 DENTAL UNITS

The most elaborate units incorporate or provide space for almost everything that a dentist uses during operation. Space requirements in surgery are likely to vary to some extent according to equipment policy and detailed planning of services is sure to do so.

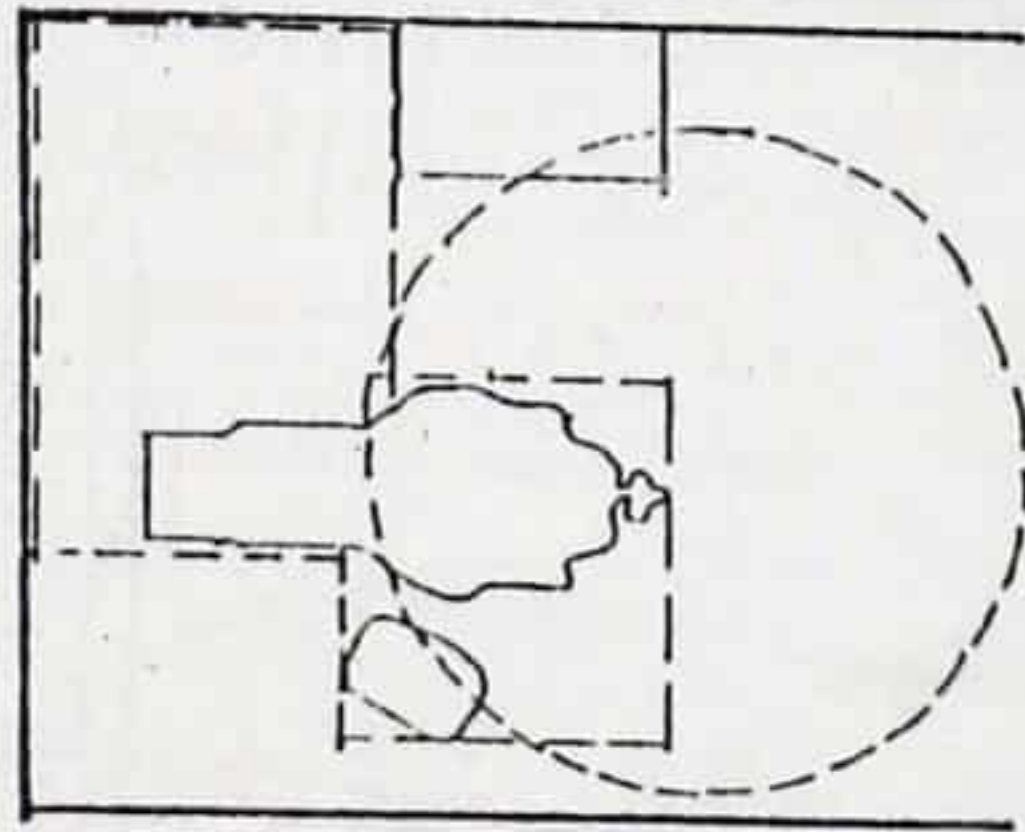
The most comprehensive units available can be expected to incorporate the following principal items of equipment.

- A) Variable speed electric engine and handpiece (drill speeds up to about 15,000 rev/ml)
- b) Airturbins handpiece (drill speed between 250,000 to 300,000 rev/min)
- c) Cold water pressure syringe
- d) Warm water pressure syringe and reservoir
- e) Bracket instrument table or cervical tray with bunsen burner
- f) Spittoon with flushpipe and waste



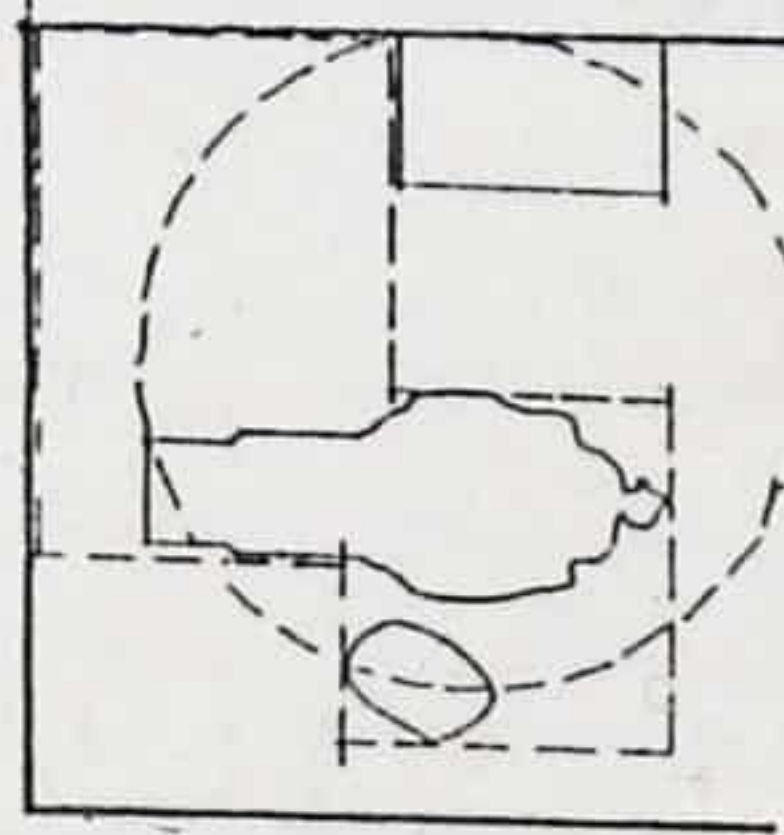
MINIMUM ZONE FOR PATIENTS IN DENTAL SURGERIES.
SOME PARTS OVERLAP DENTIST'S AND ASSISTANT'S ZONES.

B



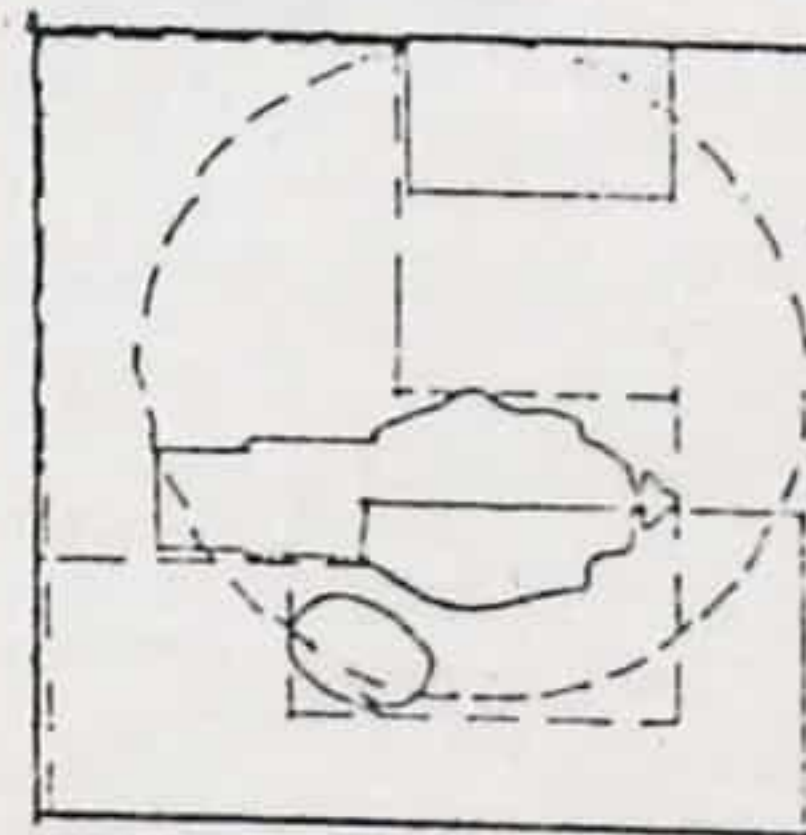
DENTIST'S OPERATIONAL ZONE WHEN A PATIENT IS TREATED IN THE PRONE POSITION.

C

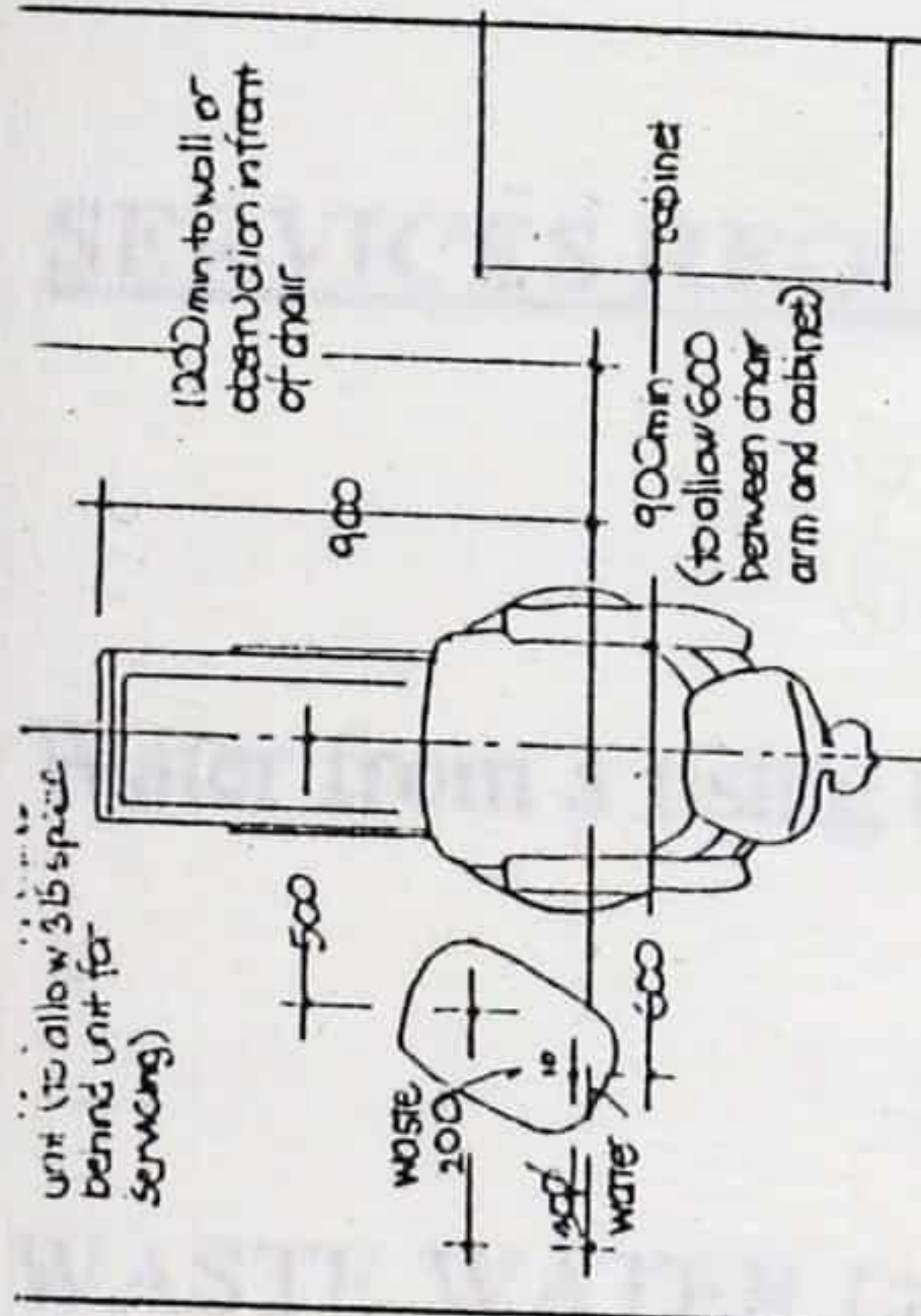


DENTIST'S OPERATIONAL ZONE WHEN PATIENT IS TREATED IN THE UPRIGHT OR NEARLY UPRIGHT POSITION.

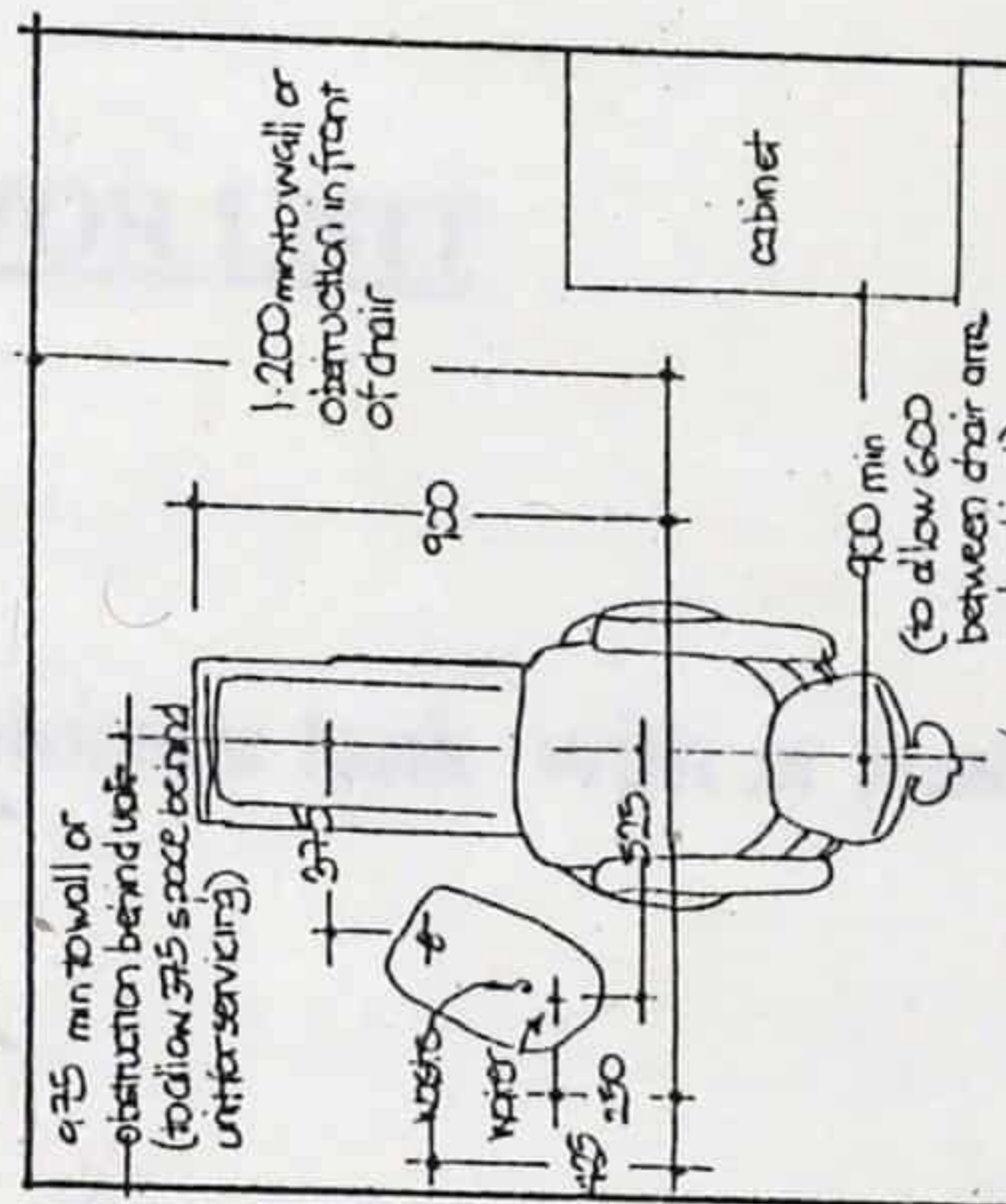
D



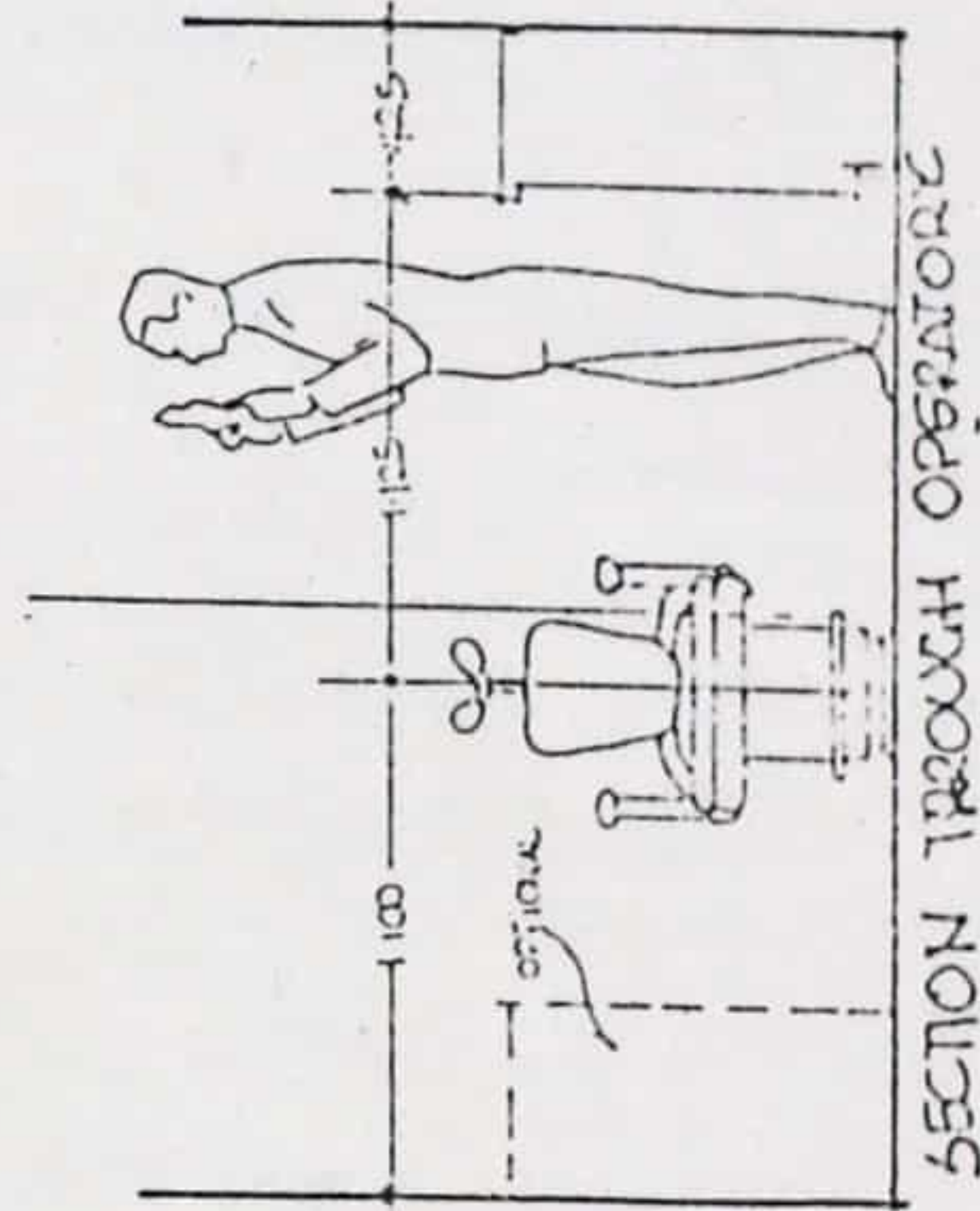
DENTAL ASSISTANT'S ZONE DURING OPERATIONS.



MINIMUM DIMENSIONS OF UNOBSTRUCTED SPACE AND LOCATION OF FIXED DENTAL UNIT FOR DENTIST OPERATING ON PATIENT IN THE INCLINED OR PRONE POSITION.

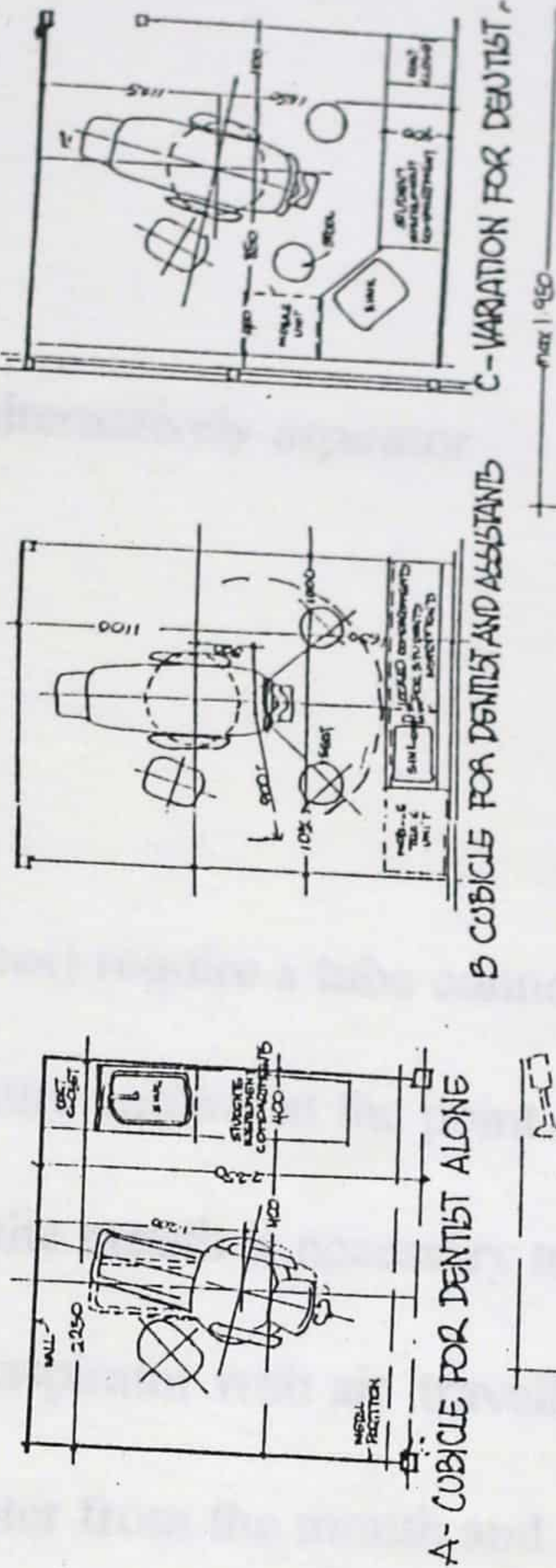


MINIMUM DIMENSIONS OF UNOBSTRUCTED SPACE AND LOCATION OF FIXED DENTAL UNIT FOR DENTIST OPERATING ON PATIENT IN THE UPRIGHT POSITION.



SECTION THROUGH OPERATOR

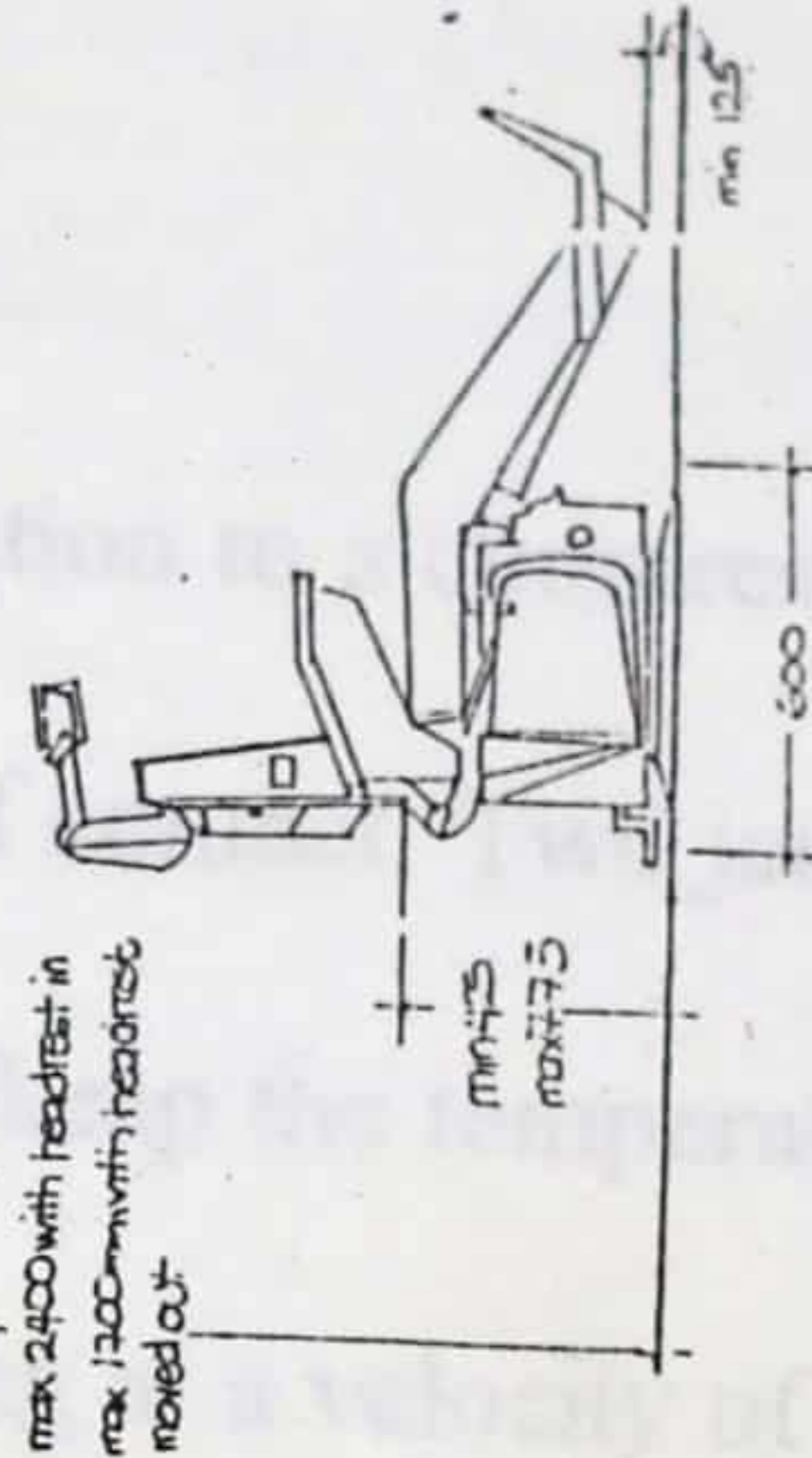
IT BASICALLY IS COMPOSED OF THE DENTIST, EXTRACTORS, SCALING AND POLISHING ARE DONE IN THE SURGERY. ITS SPATIAL DIMENSIONS ARE DETERMINED BY THE DENTAL CHAIR AND ITS ANTHROPOMETRICS. IT USES GAS, COMPRESSED AIR AND ELECTRICITY. THESE SERVICES SHOULD BE CONSIDERED IN THE DESIGN AND REMOVAL OF THEIR WASTE. A SURGERY SHOULD HAVE A NICE, WELL LIGHTED ENVIRONMENT AND SHOULD BE AS COMFORTABLE AS POSSIBLE.



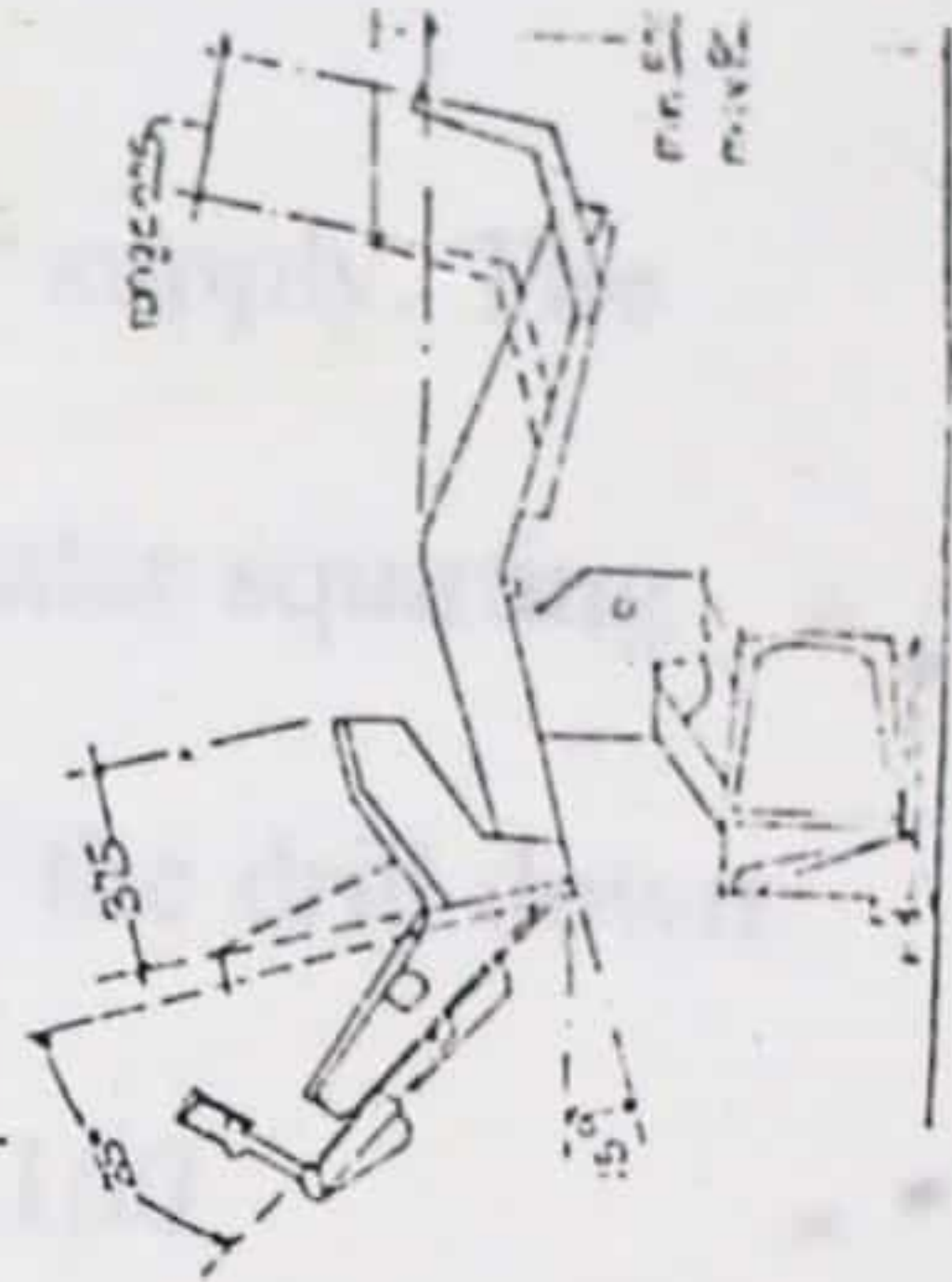
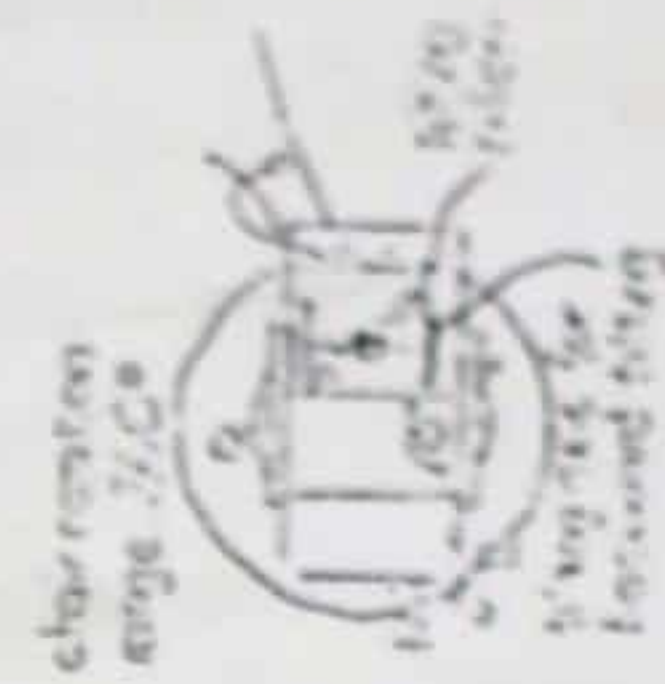
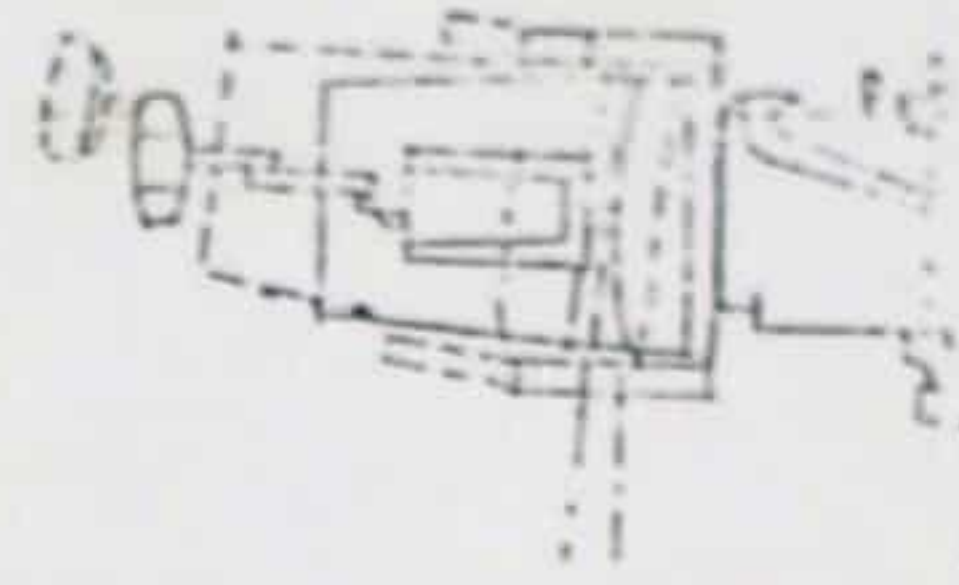
A- CUBICLE FOR DENTIST ALONE

B CUBICLE FOR DENTIST AND ASSISTANTS

C-VARIATION FOR DENTIST



max 2400mm with headrest in
max 1300mm with headrest moved out



- g) Tumbler filler
- h) Warm air syringe
- i) Saliva ejector or alternatively aspirator
- j) Operating light

Air turbine drills (handpieces) require a tube connection to a compressed air supply. The high speed of air drills require cooling at the point of contact. Two jets of water squirting 50cc of water/minute into the mouth is necessary to keep the temperature of the drill down. High velocity low vacuum aspirator with air travelling at a velocity of 80 to 160 kilometres/hour remove water from the mouth and spray from the air.

6.9 SERVICES REQUIRED FOR UNIT

1. Water from a rising main or storage tank with at least 18m head.
2. WASTE WATER OUTLET: Traps are usually incorporated in units. Outlets of 25mm diameter will suffice.
3. Electrical Supply: Cable from a remote switchbox should be at least .003sq. In.

- 4 GAS: A 12mm diameter supply from the central gas supply for the bunsen burner.
- 5 AIR: Compressed air from a compressor located in some other part of the premises. Pipe of 6mm diameter is usually adequate.
- 6 VACUUM: Vacuum lines from a blower located elsewhere may be needed. If a unit incorporates an aspirator, 30mm or 50mm diameter pipes are probable sizes.

6.10 INSTRUMENT CABINETS

The basic minimum is a cabinet with drawers for small dental instruments, a space for things in constant use such as hypodermic syringes. (Kept in sterile solution or packs) burs, wool rolls gauze etc. A cupboard or drawer for medicament or drugs is provided and also space for napkins, new receivers and expandables is provided.

6.11 DENTAL OPERATION ACTIVITIES OF DENTIST

The work of the dentist can be broadly classified under three main headings:

CLASS A NON PENETRATIVE WORK

CLASS B PENETRATIVE MINOR SURGERY

CLASS C MAJOR ORAL SURGERY

CLASS A NON PENETRATIVE: This group include (peridentics) - disease of supporting structure of the teeth) prosthetics, orthodontics surface anaesthesia. The work done include:

Routine Maintenance

Scaling and Cleaning

Initial Therapy in the new periodental cases.

Cleaning copper cement (post operational)

from teeth

Fitting completed dentures

Fitting appliances designed to correct dental

Malformation

Administering anaesthetic gases

Applying infiltration anaesthetic paste or liquid

which work by absorption from surface of the gums

CLASS B PENETRATIVE MINOR SURGERY: This group includes local anaesthesia, Conservation Paeddodentics, extraction and periodontics.

The work done include:

Drilling of teeth by abrasion and fitting of crowns and other cappings.

Implanting artificial teeth after extractions

Conservation especially for children

Removal of defective teeth - preliminary for prosthetics, ginquevectomy an operation to remove soft infected tissues.

CLASS C MAJOR ORAL SURGERY

Includes Multiple extraction

6.13 IDEAL ENVIRONMENT FOR SURGERY

Temperature: A temperature of 20°C to 21°C should be maintained as patients may react to shock or tension by feeling cold.

Ventilation: Mechanical ventilation is essential as strict control of air cleanliness is needed. A ventilation rate of 12 air - changes an hour is needed to reduce air borne infection.

Humidity: The relative humidity is controlled at 55 percent to reduce vapour explosion due to sparks from the discharge of static electricity.

Lighting: A good level of general lighting of about 400 lux provided by fluorescent lights is necessary. Operating light giving colour - corrected, shadowless, uniformly distributed light of 20,000 lux focus light into the patients mouth from a distance of about 1m.

Colour : The colours used on the walls, floor and ceiling of surgery should be light to ensure satisfactory integration of light by reflection.

Reflectance of ceiling - 70%-80%

Reflectance of walls - 40%

Reflectance of floor - 10%-40%

6.14 SURGERY LAYOUT

Surgery layout may range from highly personalised design to Dental cubicles

6.15 DENTAL MECHANICS LABORATORIES

This study is to show some of the procedures and activities that occur in dental mechanics' laboratories and the major items of equipment for which position have to be planned when designing them.

Typical layouts and some notes on environment has been treated.

6.16 LABORATORY WORK

Work done by dental technicians include fabrication, repair of all prosthetic appliances, inlays, crowns and bridges from information given by dentists. The work relates mainly to prosthetic and orthodontic dentistry.

Wash technique used by a dental technician requires special skills and equipment and so dental laboratories may be considered as a set of spaces for particular activities even though

Gas is required for heating both air and steam pressure machines which are manually operated. Centrifugal machines need bolting down to a firm bench top. With these machines the investment is heated either by a gas jet before rotation or in a furnace.

ACRYLIC RESIN RESTORATIONS

Acrylic resin is employed for inlays, caps, crown and artificial teeth among other uses. It is supplied in clear liquid polymerises under the action of heat and light and so cool dark storage condition are essential. Other materials are added for pigmentation and plasticising. The material is used by moulding mixtures of monomer, polymer and plasticiser and providing suitable conditions for it to harden.

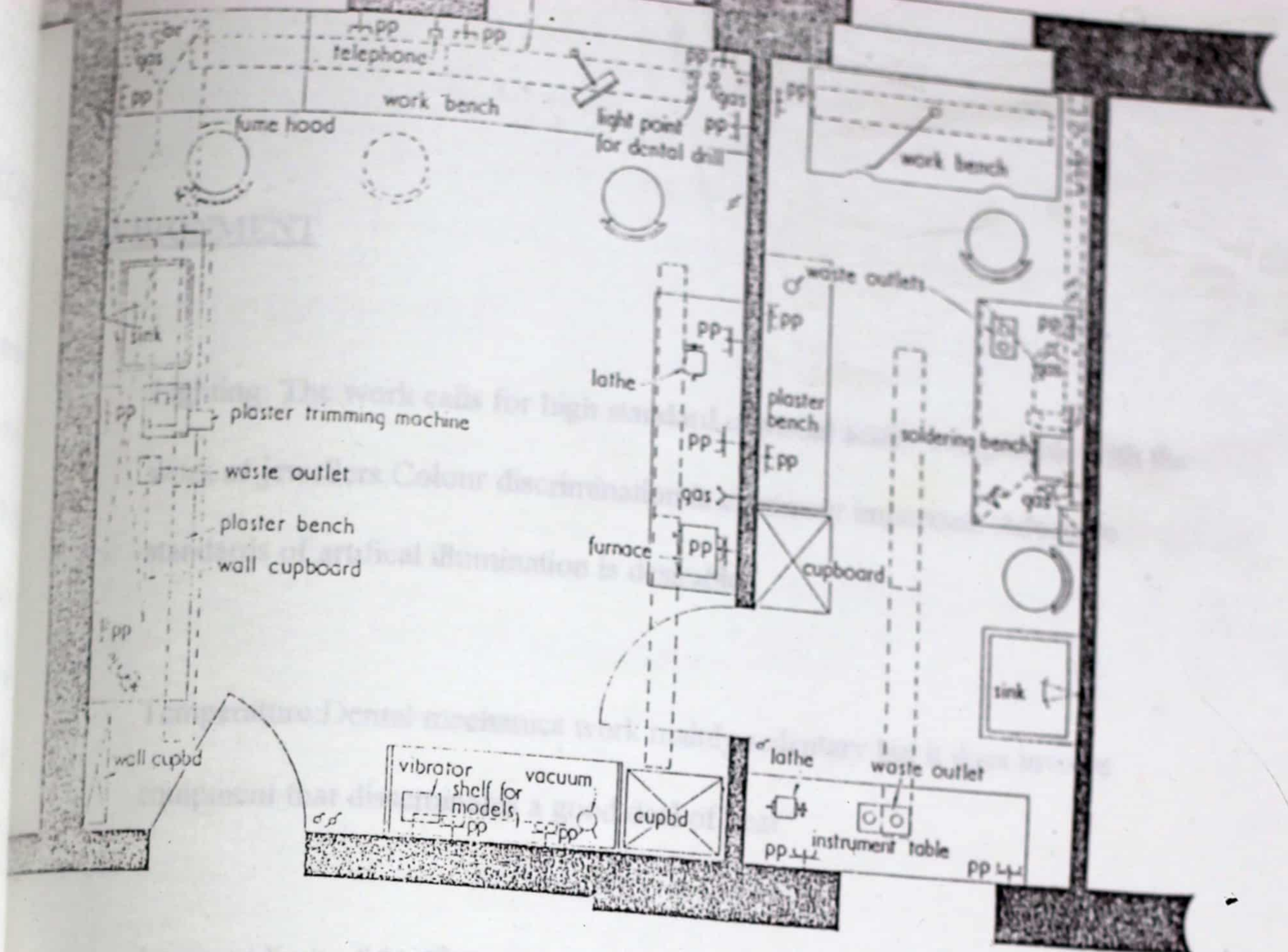
Wax models are made and invested in plaster as previously described except that the wax is removed from the plaster by boiling. At this stage spring loaded flasks are used. Mixing is done either in the flasks or in separate vessels. When ready material in flasks is processed under pressure for about 30 minutes at 60°C in a thermostatically controlled oven or water bath. After that clamp screws are tightened and further heating at 60° and 100°C is applied. When processing is complete the plaster block is taken from the flask and split. It is sometimes necessary to put the acrylic casting into hydrochloric acid to clean it of the last traces of plaster. Final trimming is done with sandpaper discs and, sometimes, a thin metal circular saw.

ORTHODONTIC APPLIANCES AND OTHER METAL WORK

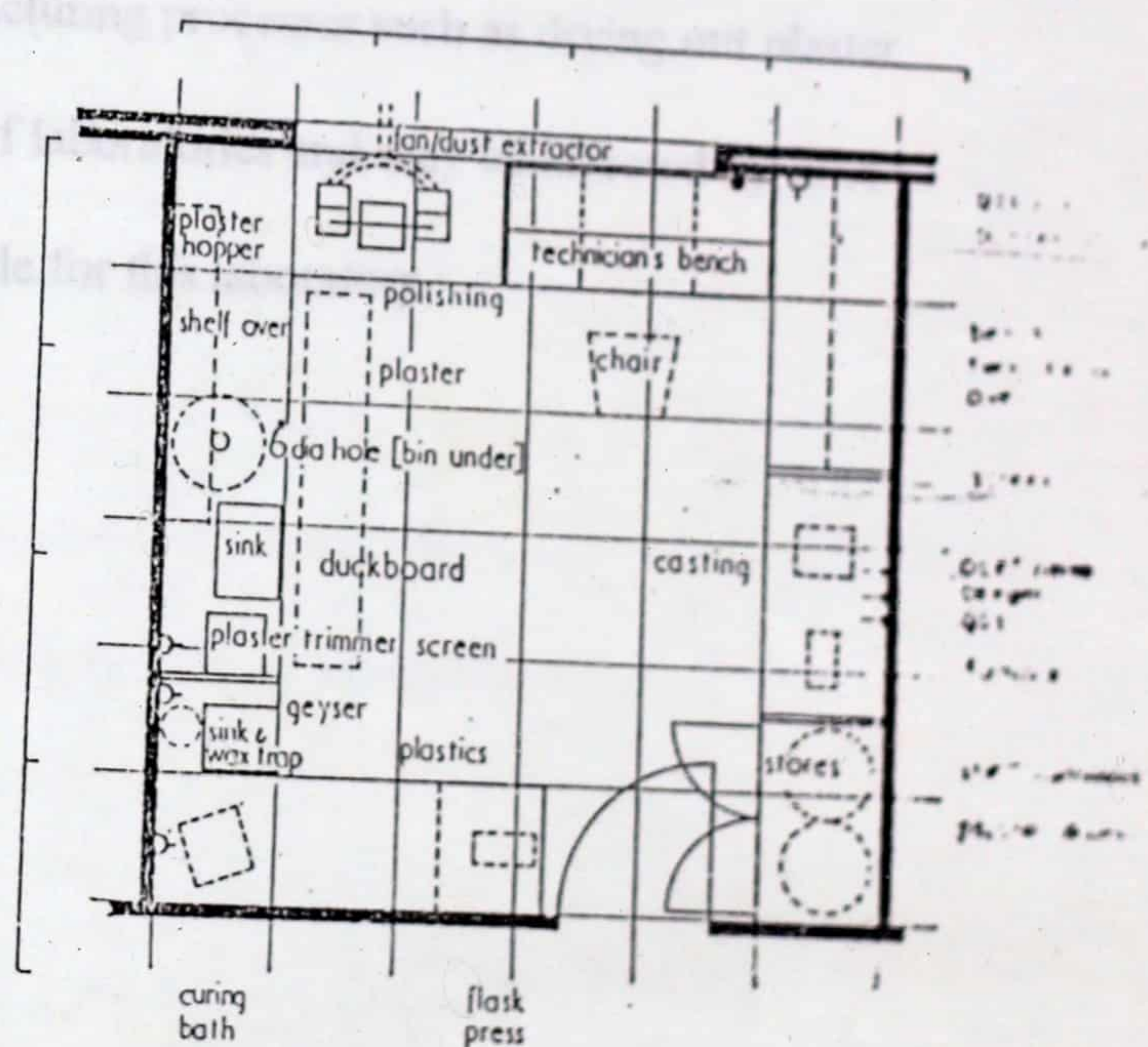
Many dental appliances are made from wires, screws and so on. These require accurate three-dimensional bending, soldering and welding. Some of the more advanced dental restoration techniques also call for alloy castings of considerable complexity. The equipment already mentioned is used but addition welding torches, sand blasting machines, electroplating baths, polishing machines, dental lathes and blow torches are required.

NATURE OF WORK

Many of the processes employed in dental laboratories create waste material. Some create dust and some materials such as plaster of paris are themselves dust producing when handled. It is wise to provide convenient disposal points in the form of worktop outlets to chutes discharging into waste bins underneath. At the same time dust creating processes are best separated from fine work where cleanliness is of great importance. Again some processes are wet and some employ acids and dangerous electrolytes, so that washing down is often necessary in the areas concerned, including the floor.



1 Example of planning for a dental mechanic's laboratory serving a number of practices



2 Standard plan for a dental mechanic's laboratory issued by MOPBW for dental centres in military establishments. A 20 grid has been superimposed. The divided lines show equipment

ENVIRONMENT

1. **Lighting:** The work calls for high standard of visual acuity comparable with the work of jewellers. Colour discrimination is extremely important. Adequate standards of artificial illumination is desirable.
2. **Temperature:** Dental mechanics work mainly sedentary but it does involve equipment that disseminates a good deal of heat.

An upper limit of 21.7°C probably represents the acceptable maximum temperature. Some of the processes eg. Setting times for the acrylic resins are affected by warm temperatures may not be acceptable.
3. **Ventilation :** Some dental manufacturing processes such as drying out plaster investments add to the humidity of laboratories and may be affected by it. A temperature of 18.8°C is acceptable for this laboratory.

LAYOUT

6.17 DIAGNOSTIC X'RAY

Room containing X'RAY machines must be shielded through the use of lead-lined walls or appropriate building materials of an adequate thickness. In addition controls for X'ray machines should be located behind shielded screens.

LAYOUT

This plan includes eight rooms where the roentgenograms utilised in routine oral examinations are taken and one extra oral radiology room.

In the radiology rooms, the machine is located behind the dental chair and up to 20 degrees to either side, the recommended position. Observation of the patient is made through a lead glass viewing window which has a speaking lot. Each of the rooms is equipped with a small chalkboard, illuminator, lavatory and a shelf.

The extraoral radiology room is of slightly greater depth than the intraoral because a long focus film distance is required for the facial-profile reontgenogram.

FILM PROCESSING

A suite of rooms for film processing includes a dark room oversized to permit group instruction, a wet viewing and drying room and a mounting room. Air conditioning in the darkroom and wet viewing room is desirable not only for the comfort of personnel but for the protection of the exposed film. Maintaining air at a positive temperature will prevent dust from entering around windows and doors.

6.18

GENERAL STERILE SUPPLY DEPARTMENT (CSSD)

FUNCTION: For the maintenance, sterilization, storage and supply of all sterile materials and instruments used in the various clinical department of a hospital.

DESIGN

The planning of CSSD must conform to the sequence of work from the reception of materials for sterilisation to their dispatch from the department. In outline the sequence is as follows:

SEQUENCE OF WORK

1. Materials are received into department from various sources for e.g the Central Stores, from the laundry and from the hospital departments.

- 2 All used materials and new materials are cleaned - preliminary cleaning to remove blood, pus and other substances.
- 3 Clean materials are inspected, assembled and packed ready for sterilisation.
- 4 They are sterilised.
- 5 They are either stored in a sterile storage - area in the department or distributed directly as required.

STERILIZATION

Autoclaves are generally used in central sterilising departments. Provision being made for adjusting the steam pressure in the autoclaves according to the nature of the articles to be sterilised.

Hot air ovens at a temperature of at least 145°C are used for syringes. The CSSD may not be airconditioned depending on its location. Natural light is desirable. Artificial light should provide a general level of illumination of 20-30 lumens/square feet and local and adjustable light sources for fine work requiring concentration such as needle sharpening.

FINISHES

Floor and wall finishes should be easily cleanable.

It is not necessary to provide slucing down the floor except in the clean up room. The method of supplying goods from CSSD to the department depend on the broad principle of planning for the hospital as a whole. These studies have been made to throw more light into the operation of an oral health centre and afford a better understanding which is necessary for the final design to be appreciated and judged.

6.18 CASE STUDY 1

STRUCTURE

Building is made in timber located close to main Medical School Administration, makes it easy to locate.

Extension has been added to it for Doctors' offices.

PERSONNEL:

Has two (2) full time lectures, four (4) part time, three (3) residents in oral surgery, One (1) dental technologist, One (1) hygienist, dental surgery assistants and administrative staff.

OUTPUT

Has trained thirty (30) dentists so far.

Departments

1. Restorative Dentistry which includes:

Conservative Dentistry

Prosthetic Dentistry

Periodontology

Material Science

2. Child Health Community and Prevention Dentistry.

3. Oral Surgery and Radiology
4. Oral Medicine and Oral Pathology
5. Orthodontics.

EQUIPMENT

- 2 Dental Chairs
- 2 Phantom head units
- 1 Prosthetics lab
- 1 Compressor.

MERITS

Both surgeries are fully equipped

Has a good combination of all workers

Has one large operatory which has adequate space for tutorials (7m x 5m)

DISEASE PREVALANCE

Diseases treated at the school are of the following percentages:

Extractions	77%
-------------	-----

Trauma	9%
--------	----

Periodontal	18%
-------------	-----

DEMERITS

Structure is temporal, a more permanent structure would have been better.

X' ray equipment cannot be utilized because structure (walls) are not leaded.

Extension not properly done - roof gutter leaks.

One lecture room for all departments.

Two dental chairs for ten students is grossly inadequate.

One student should be assigned to one chair.

One technician for the whole school slows down work.

Corridors (1.8m) are also used as waiting areas since reception is very small (24m x 3m)

Shares parking space with main administration.

Cannot cater for a large number of patients-patients are treated at the dental clinic in the main hospital.

Cannot perform operations since it does not have a theatre.

CONCLUSION

Structurally, the Korle-bu dental school is inadequate and unsafe. Its equipment shortage does not allow for the proper training of students thus students are better theoretically than practically.

A good dental school should be fully equipped.

6.20 CASE STUDY 2

GENERAL OBSERVATIONS

Building is yet to be completed. Form follows simple rectangular traditional courtyard style with corridors running through and linking spaces. Construction has been immediate needs and are not elaborate.

MERITS

When completed, will help cater for more students (10) clinical students.

Has facilities for staff and general administration which are not in the first one.

Has laboratory for students.

Provisions of stores for materials and archives, toilet facilities for the public have been provided. Ducts have also been provided for easy servicing and spaces have been provided for ducts and compressors.

Building has been designed on 12'6" grid for easy construction.

DEMERITS

Even though a new project, is already inadequate for the students. If ten students are to be admitted each year, then each clinical student needs a dental chair-at least 30 chairs for 3 clinical years should have been provided.

Functionally, the administration should be linked to other facilities such as an accounts office but these have been separated.

The Doctor's office should be connected to the consulting rooms for easy accessibility.

One lecture theatre for the whole facility is inadequate for three clinical years.

Specialist departments like orthodontics, maxillofacial surgery child care are absent from the facility.

In conclusion, even though the facility is an improvement on the first one. It is inadequate as a dental school.

CHAPTER SEVEN

7.0 ORGANIZATIONAL STRUCTURE

HOSPITAL ADMINISTRATOR

CHIEF SURGEON

SPECIALISTS

GENERAL PRACTITIONERS

ADMINISTRATOR

CHAIRSIDE

DENTAL

LABORATORY

ADMINISTRATIVE

SUPERVISOR

HYGIENIST

TECHNICIAN

ASSISTANT

CHAIRSIDE

ASSISTANT LABORATORY

RECEPTIONIST CLERK

ASSISTANTS

TECHNICIANS

DENTAL SURGEONS

Do major operatory work.

DENTAL THERAPISTS

Educate on oral hygiene especially in
children

DENTAL HYGENISTS

Do scaling and polishing of teeth

DENTAL TECHNOLOGISTS

appliances.

Laboratory based and fabricates dental

ASSISTANT TECHNOLOGISTS

Assists dental technologist

CHAIRSIDE SUPERVISOR

Main supervisor dentist

CHAIRSIDE ASSISTANTS

Assists dentists, hygenists, therapists.

GENERAL PRACTIONERS

Resident dentists, general practioners.

SPECIALISTS

Specialized in various aspects

ADMINISTRATIVE ASSISTANT

General running of the facility

RECEPTIONISTS

Receives visitors

CLERK

Sees to paperwork.

7.1 ORAL HEALTH WORKERS IN PUBLIC SECTOR

DENTAL SURGEONS

68

THERAPISTS

6

TECHNOLOGISTS

6

CLINIC ASSISTANTS

90

CHAPTER EIGHT

1.0 CLIENTS BRIEF/SCOPE: The project is to include the following:

Waiting Area

Dispensary

Records Department

Diagnostic Clinic

General Clinics

Department of Oral Surgery

Department of Restorative and Conservative

Dentistry

Department of Orthodontics

Department of Periodontics

Department of Paedodontics

Research facilities

Medical Gas Supply Department

Maintenance Workshop

Mechanical Plant Rooms.

8.1 ACCOMMODATION SCHEDULE

A SUB-BASEMENT

1.	Storage Area	148.50
2.	Children's Play Area	181.50
3.	Store rooms	56.16
4.	Wash rooms	19.00

B GROUND FLOOR PLAN

1. Parking

Public Parking

Private Parking

2. General Area

Entry Terrace	49.00
Foyer Records	294.50
Store (furniture)	13.50
Telephone	13.50

3. General Clinics

Waiting Areas	241.68
Consulting Rooms (4no.)	102.72
Wash rooms	16.20
Injection Room	20.60
Store	4.00
Recovery Room	25.92
Circulation Space	123.68

4. Oral Surgery

Doctors' Room	33.64
Services Area	40.60
Theatre	45.24
Nurses' Changing Room	21.84
Entrance Terrace	8.40
Resussitation	29.00

Waiting Area	20.88
Patients' Changing	53.64
Medicine Store	6.76
Linen Store	6.76
Doctors' Changing Room	27.68
Anaesthetist(Preparation)	23.20
Scrub	6.24
Equipments store	8.58
Recovery Ward	66.08
Waiting Area	45.76
Circulation Area	158.64

5.	<u>Dispensary</u>	
	Dispensary	33.06
	Storage	10.50
	Office	10.89
	Septic Lab	8.25
	Dispensary Lab	33.64
	Waiting Area	180.44
	Shops	22.80
	Toilets	11.52

6a Services Area

Airhandling Units

12.48

Store rooms

18.72

Toilets

68.64

Circulation

32.56

6 MUSEUM

Display area

51.04

Office

10.64

7 Bookshop

83.6

8 General area

Docs' Common Room

42.50

Air handling Unit

12.48

Storage

18.72

Toilets

68.64

Circulation

32.56

9 Prosthetics Laboratory

Sitting area

31.20

Residents lab

31.32

Heavy Prosthetics	76.70
Storage	15.68
Offices	9.62
Light Prosthetics	76.70

<u>10</u>	General Circulation	758.8
	Treatment	10.50
	Recovery Room	30.25
	Circulation	141.48

<u>8</u>	<u>Prosthetics Laboratory</u>	
	Waiting area	28.20
	Surgery	31.36
	Office	16.80
	Laboratory	76.42
	Storage	15.68
	Changing Room	20.52
	Circulation	117.50

<u>9</u>	<u>General Circulation</u>	
	Staff toilet	15.84
	Circulation	348.00

D SECOND FLOOR PLAN

1. Foyer

Multi-Purpose area

343.5

Storage

27.0

2 Public Health Lab

Laboratory

62.7

Office/Store

7.84

3 Histopathology Lab

Laboratory

62.70

Office/Storage

7.84

4 Seminar Rooms

205.92

5 Library

Reception/Reading area

79.12

Office

16.64

Surgery

63.84

Store

12.80

Docs' Common Room

22.04

Wash Rooms

11.40

Circulation

81.90

4 Conservative & Restorative

Waiting Area	65.24
Surgery	43.20
Recovery	15.20
Wash Room	4.80
Circulation	21.60

5 Paedodontic Clinic

Waiting/Playing area	77.44
Docs' Common Room	33.64
Storage	11.52
Surgery	42.56
Demonstration	80.90
Circulation	56.00

6 Services Area

Informal Seating	44.72
Air handling Units	12.48
Storage	18.72
Toilets	68.64
Circulation	32.56

<u>7</u>	<u>Periodontic Clinic</u>	
	Waiting area	32.00
	Doc's Common Room	33.64
	Storage	7.96
	Wash rooms	3.84
	Surgery	39.20
	Sterilisation/Nurse	9.50
	Generator house	15.2
	Circulation	146.7

<u>18</u>	<u>General Circulation</u>	
	Circulation area	424.20
	Security	62.72
	Stairhalls	94.10
	Ramps	181.90
	Staff Washrooms	15.84

6 FIRST FLOOR PLAN

1	<u>Foyer</u>	
	Waiting/Reception	294.50
	Wheelchair Store	13.50
	Furniture Store	13.50

2	<u>Administration</u>	
	Reception	32.40
	General office	44.52
	Doc's Common Room	44.52
	Cleaners' Storage	5.32
	Waiting Area	63.84
	Matron	13.44
	Surgeon	13.44
	Accountant	13.44
	Secretary	12.48
	Administrator	35.96
	Washrooms	7.96
	Utility area	10.80

3	<u>Orthodontic Clinic</u>	
	Waiting Area	78.88
	Records	11.40
	Tracing	33.64
	Treatment	11.52

10	<u>Infants' Ward</u>	
	Nurses Station	15.75
	Female Ward	51.48

Male Ward	45.24
Wash Rooms	20.16
Circulation	81.60

11 Female Ward

Nurses' Station	18.40
Special Wards	32.76
Main Wards	159.92
Wash Rooms	35.28
Utility Area	37.80
Laundry	12.88
Stores	4.32
Circulation	110.50
Common Room	27.60

12 Children's Ward

Nurses' Station	34.04
Special Ward	10.80
Male Ward	43.20
Female Ward	43.20
Wash Rooms	30.20
Utility Area	18.00
Circulation	66.00

17 Maintenance Unit

Foyer	46.75
Office	33.64
Storage	268.40
Workshop	84.00
Plant Rooms	16.20
Boiler Room	34.80
Female Changing	44.60
Male Changing	46.40
Store Rooms	10.00

7 Haematology Laboratory

Changing Room	33.64
W.C	3.00
Store-room	3.00
Laboratory	32.48
Laboratory stores	16.80
Cold Store	10.50
Records	36.64
Office	15.68
Waiting Area	28.00
Circulation	84.76

<u>8</u>	<u>Radiology Clinic</u>	
	Office/(Records)	15.08
	Changing Rooms	28.20
	W.C	3.04
	Wet Viewing	12.96
	Dark Room	9.72
	Extra Oral	12.96
	X-Rays	28.86
	Waiting Area	28.00
	Circulation	132.00

<u>9</u>	<u>Male Ward</u>	
	Nurse Station	13.50
	Common Room	34.65
	Special Wards	32.76
	Main Wards	92.80
	Wash Rooms	30.24
	Laundry	11.20
	Storage	8.40
	Utility Area	26.40
	Circulation	107.24

b

General Area

Informal Seating Area	40.32
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Nurses' Common Room	49.28
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Kitchen & Stores	47.04
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Laundry	49.30
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CHAPTER NINE

9.0 SITE SELECTION

The basic principle underlying the policy of Health zoning of Kumasi is having it in a main health delivery area: Komfo Anokye Teaching Hospital Area; with other satellite Health delivery areas for the Sub-Urban areas within the metropolis. These are however, grouped as follows:

- a) Manhyia, Aboabo, Asawasi, Dichemso, Ashanti New Town.
- B) North and South Suntreso Kwadaso and Bantama.
- C) Akwasi, Atonsu, Chirapatre, Agogo
- D) Suame, Old and New Tafo, Pankrono
- e) Bomso, Ayigya, Ayeduase, U.S.T. ETC.

It must be emphasised here that since the project is a specialist department in the Hospital K.A.T.H, and the teaching programmes of the Clinical students, it is considered very ideal to site it on the main health delivery area - K.A.T.H.S' premises.

It will also serve as a core area for Mobicledents - Mobile dental clinics to serve the other districts.

Other general factors that were considered

- 2) Enough land for the development and possible expansion.
- 3) Good vehicular access

- 4) Quite close to the S.M.S Clinical students hostel, nurses quarters, kitchen and other service centres and the E.N.T, a related facility.

DEMERITS

- 1) Slopes steeply toward the nurses quarters.
- 2) Close to the mortuary and service area (noise generation)
- 3) Situated on a lower gradient whiles the rest of the Hospital is on higher grounds.

SITE 2

Presently it is a virgin land.

MERITS

- 1) Good accessibility to rest of the Hospital
- 2) Good vehicular accessibility.

DEMERITS

- 1) Quite a deep gradient along the eastern border (Restriction).
- 2) Restricted land in terms of expansion
- 3) Very steep site with deep gradient - which vice increase cost.

CONCLUSION

SITE 1 was chosen due to its advantage over SITE 2.

9.1 SITE ANALYSIS

Reasons for choosing site:

Gentle Topography thus reducing cost.

Size of land will enable extension and flexibility in design which is one of the criteria for health related facilities.

Traffic is almost non-existent which is an advantage to Pedestrians.

9.2 SIZE OF SITE : Approximately 2.2HA

9.3 ACCESSIBILITY: Site is mainly accessible from the service road in front and by pedestrian walkways from the O.P.D. and the students Hostel.

9.4 TOPOGRAPHY: Site generally slopes towards the nurses quarters . The gradient is about 1: 6.-

9.5 Rainfall : Rainfall is 1905mm-1016mm. While mean rainfall is about 1473mm. Two patterns exists in Kumasi, thus double maxima-June/May, September/October.

9.6 Temperature : Hot humid climate,

Day temperature ranges between 27°C - 30°C.

Highest mean is March/April,

Lowest mean is August.

- 9.7 Wind Direction : Naturally South West- North-East with average velocity of about 2.4-4m/s.
- 9.8 Relative Humidity : Quite High, mornings range between 55% - 63%
Afternoons range between 85%-94%.
- 9.9 Geology : Site lies 2722m above sea level.
Soils are ochro and lateritic.
- 9.10 Vegetation : Quite moderate even though soil is lateritic, Fruit trees, shade trees
and climbing plants have been planted.
- 9.11 Services : Water is to be tapped from mains on the Bekwai road.

Electricity is already existing on site, telephone, water hydrants.

CHAPTER TEN

10.0 CONCEPTUAL SITE DEVELOPMENT

10.1 CONCEPT: The Philosophy of a smile that shows good dentition and an absence of oral diseases was used to develop a concept of an open, hygienic and warm, pleasant environment for the facility was used.

This openness in design also suited the type of facility ie. A health facility and the hot humid climate I was designing in Factors used to achieve this concept was:- courtyards, single banking, wide corridors to allow trolley, wheelchair and people, good lighting and ventilation by well positioned fenestration.

10.2 SEARCH FOR BUILDING FORM

Two traditional forms of Hospital design were researched into :-

- The radial form
- The Pavilion form

The Radial Form :-

This involves having a centrally located shared facility then other specialist facilities radiating from the centre.

Patients will have to come out of one facility use the central link then enter another facility

The Pavillion Form:-

This involves an addition rectangular forms linked by corridors. This makes it easier for extensions or additions to be made as is usual with simply be connected to the rest of the facilities by a corridor

Existing Forms at Komfo Anokye Teaching Hospita From studies done, the radial and pavillion forms of Hospital design both existed at KATH. They also had flocks which went four storeys high. Use of lifts and staircases are matimized.

10.3 CHOICE OF FORM;

This generated from a combination of forms at Komfo Anokye. The Pavillion type of the Polycline, the Gross type of the OPD and the longitudinal block of the wards.

10.4 Conceptual Site Development

Alternative 1:-

This was evolved around the radial form with a contralized general and diagonistic area leading to speciallized areas. The Oral surgery block closet to the main road with wards in between

- Merits: - Centralizing main facility is good for easy record keeping and functional relationship
- All other clinic will be equidistant from each other.

Demerits: - Having the diagnostic and general clinic centralized will mean heavy traffic and conflicts at the center, since patients come from all other clinics to use it.

- The Radial form does not utilize the maximum benefits of a good north/south orientation, The blocks will have to have some form of sun shading devices.

Alternative 2:- This evolved around the pavillion type intergressed with courtyards to provide lighting, ventilation and to conform to the open concept I had in mind. This had a chamfered entrance to face the curvature of the road and to make it easily visible. Clinics and other facilities are put in pavillions with the most important closer to where they are needed.

The Oral Surgery block faces the main road and is the closest to one road from the Out, Patients Department, the main surgical block and the mortuary.

Merits:-

This alternative places facilities or services at a central position to be shared by both out patients and inpatients without creating traffic.

- Courtyards also act as an area for an over spill of activities.
- Each block is linked by corridors and it is easier to relate the clinics to each other without crossing the waiting or reception area.

Demerits:- Patients will have to walk longer distances to facilities as compared to the 1st Alternative

CONCLUSION;- This 2nd Alternative was preferred since it solved more problems than the 1st one

10.5 Evolution of Design

The Design was evolved by combining the concept and the functional relationship of the facility.

10.6 Structural Systems:

A simple frame kind of system was chosen for this project. This would auger well will be the pavillion form and will allow the facility to be put up in phases

10.7 Design Module:

The basic module chosen for this design evolved from the basic dimension needed for a dentists surgery. This was chosen because all the a clinics used surgeries and this my spaces well multiples of this dimension. The design and was therefore 3m x 6m)

10.8 Approach and Spratial disposition of Facilities provided.

Generally the facilities provided were put on three floors, Ground floor, Just floor and Second floor. A sub-basement floor and a third florr were occupied by services. A medical supply depot was also provided on the ground floor to stock the Hospital and also to serve as a center for loading and off-loading mobidents and a workshop to repair broken down dental chairs and units.

Facilities were distributed to the floors in relation to the most needed ones being closer to the patients and the teaching facility on the second floor. The administration was placed on the first floor so as to have a good relationship with both the clinical area and the teaching area.

Parking was provided for staff, ambulance and visitors. Consideration was made for the greater percentage of patients who are pedestrians with wide paned walkway along the street and into the facility.

10.9 Approach to the Facility

The facility has been designed such that the main entrance is easily seen. As part of my concept I chamfered the block that composed of the entrance and waiting area, to face the street in front of facility thus making the entrance face the OPD which is the first point of call for patients.

Emergency cases that come to Komfo Anokye are first taken to the Out Patients Department and in case of accidents, to the Accident and emergency centre at the Polyclinic. They are then given first aid or in the case of injuries, sedative with anaesthesia and are transported to the facility via ambulance to the Oral Surgery department. The General Clinics however are fully equipped with all equipment to deal with an oral emergency case.

Staff come to the facility via the service road and park close to the Dispensary block which has an entrance to the facility where the staff pass.

Other members of staff who are scheduled for duty at the Oral Surgery Department use the ambulance route and park at parking spaces allotted to them. Service vans use the service route to park at either the medical supply depot or at the service yard.

10.10 Sub Basement Layout

The Sub Basement is located underneath the children ward and the part of the male ward. It serves as a play area for the children and a ramp serves as an accessway to the place. The port underneath the male ward is to be used as storage for broken down beds and other furniture which would later be sent to the main Hospital workshop area.

10.11 Ground Floor Layout

The ground floor consists of the main entrance, the waiting area, the oral surgery department to the western end and the Dispensary to the eastern end, A ramp and two staircases take patients to the floor alone. A lift has also been included to take patients who are mobile to the special clinic. Two sets of general clinics are on the northern and eastern part of the on the northern and eastern part of the waiting area with waiting and sub-waiting areas. The Injection room is in between them for easy accessibility.

Further north two service areas are on both the east and west and a centralized waiting facility both male and female patients.

To the right is the Haematology laboratory and to the left the Radiology block.

FIRST FLOOR LAYOUT

The First Floor is basically composed of the special clinics and administration.

The special clinics are:

The Orthodontic clinic,

The Periodontic clinic,

The Conservation and Restorative clinic,

The Paedodontic clinic,

and the Prosthetics clinic or Laboratory.

The Administration which is composed of offices for the chief administration. The Assistant, General Office reception and offices for Matron, Accountant and chief surgeon.

The service and sanitary areas are repeated on this floor and Common Rooms for doctors and nurses have also been provided.

10.13 SECOND FLOOR LAYOUT

The second Floor is the teaching area for large seminars for primary health care purposes.

It is composed of 2(two) Seminars rooms, a cultural research and histopathology Laboratories, a museum, a library and a bookshop. Areas for demonstrations were also included like the phantom. Head Laboratory, the Prosthetics laboratory.

Offices for lectures and resident doctors were also included in the Design.

The sanitary and service area were also translated to the second floor.

10.14 THIRD FLOOR LAYOUT AND ROOFSCAPE

The third floor is made of the Roofscape machine room for the lifts. The rest is roofscape showing longspan aluminum sheets hidden by concrete fascial.

On top of the service area is a concrete roof on which water tanks will be placed and ducted to other parts of the building.

CHAPTER ELEVEN

11.0 SERVICES

11.1 WATER:

Tapping from the mains along the service road, water goes directly to the water tanks at the service area and then distributes to the rest of the facility.

It however goes directly to the oral surgery departments, the wards and to the boiler room where steam is manufactured and then piped to the rest of the facility.

11.2 ELECTRICITY

This is tapped from the 11.04 Ky TRANSFORMER by the mortuary. This will be by the transformer to ensure constant electric supply. A bus bar chamber can act as intermediary check points for electric supply.

11.3 AIR CONDITIONING

For this facility the package unit was used to provide air conditioning department to serve the operating theatre and two other units were placed at the service areas on either side of

the facility with their chillers sitting outside . This is also piped through the facility and a/ in bulter between the ceiling aand floor slabs caters for the piping to air handling units within the facility.

11.4 SEWERAGE

Lines from the manholes are sent down to a septic Tank CLOSE TO THE MAIN Bantama road easy withdrawals.

11.5 TELEPHONE

Telephone lines from the main road are tapped to main exchange and then connected by intercom to the rest of the facility. The Directors offices and the oral Surgery Department however have direct lines.

CHAPTER TWELVE

12.0 LANDSCAPE

Shade trees like the neem (*Zaderata indica*)

Indian almonds (*Terminalia Catuppa*) and Rust tree (*Peltophonm Pterolarpus*) were used as shade for car parking and as wing breakers.

Balua grass was used because of it lends itself to easy maintainnance.

The miilletia species (negales) were used as fencing for security.

CHAPTER THIRTEEN

13.0 PHASING

The facility was divided into different phases to enable constructive to be done within budget

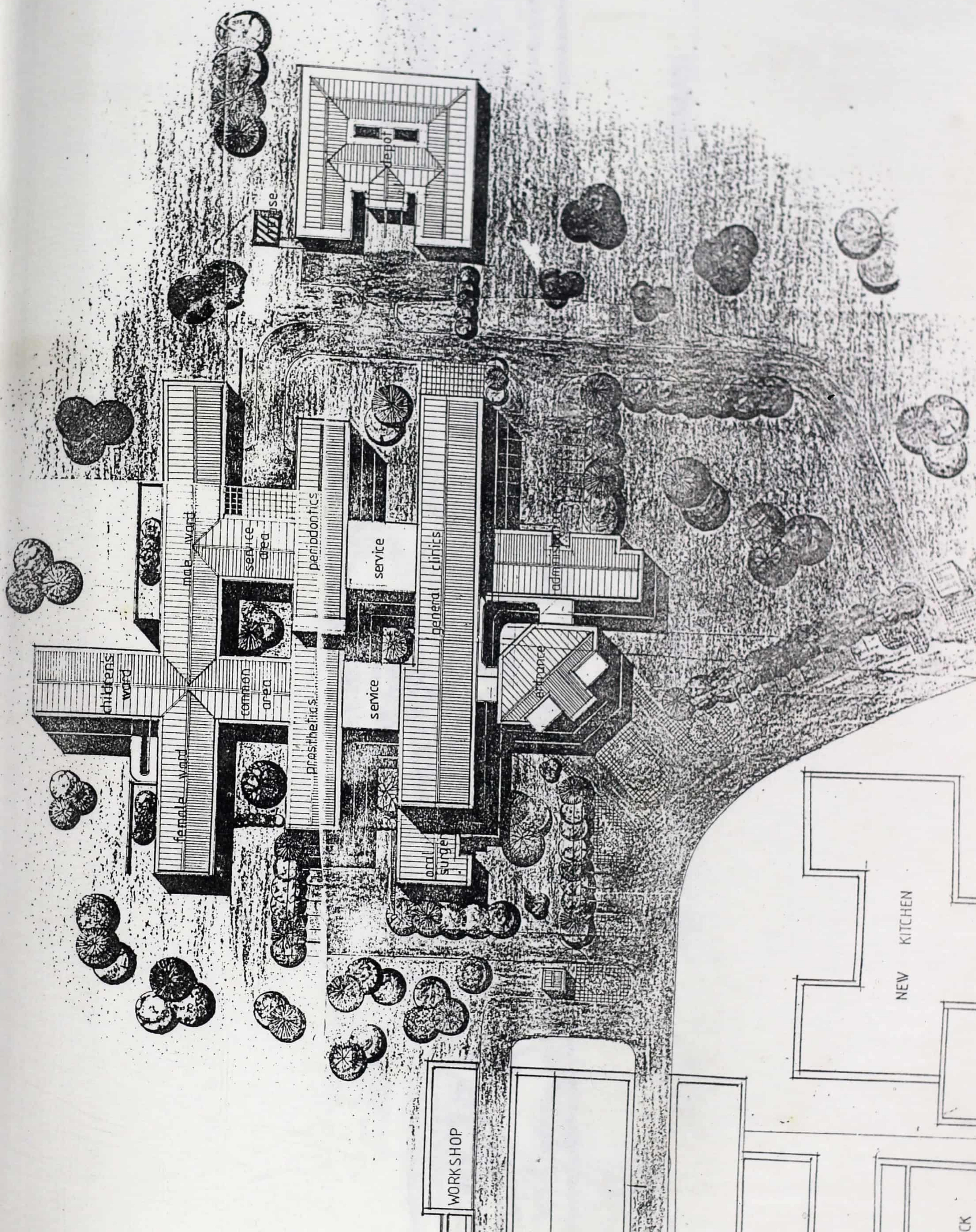
PHASE 1 Waiting area, General clinic, Dispensary, Mechanical Department.

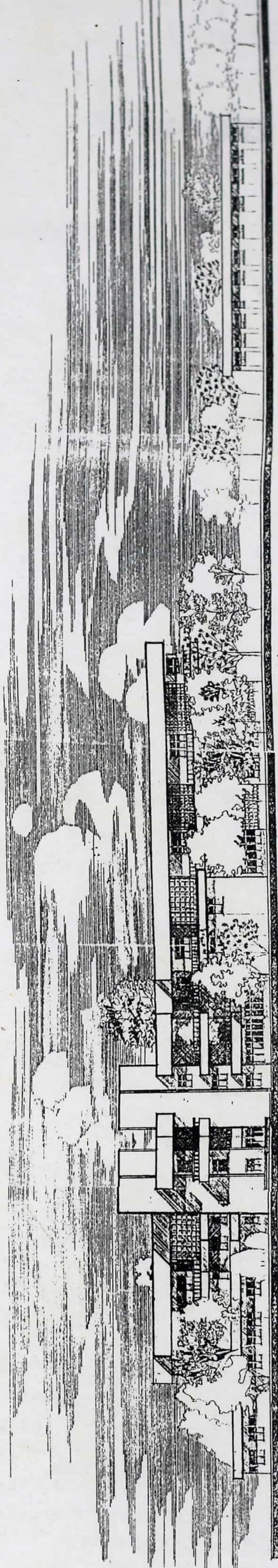
PHASE 2 Oral Surgery Department

PHASE 3 Haematology laboratory, Radiology
Department and Wards

PHASE 4 Special Clinics

PHASE 5 Teaching Area

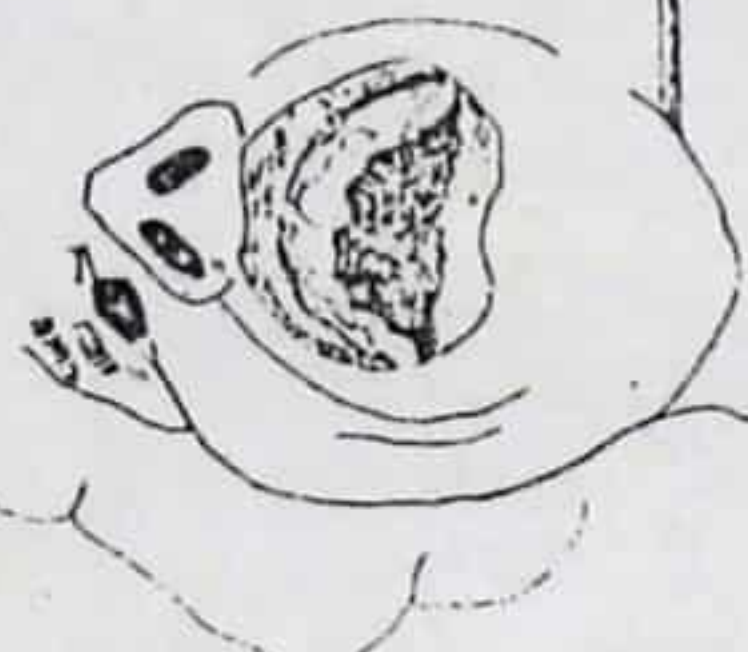




SOUTH ELEVATION

ORAL HEALTH CENTRE

KATH. — KUMASI



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