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B.R. 888 (D)

HANDBOOK FOR ROYAL NAVAL DENTAL SURGERY ATTENDANTS

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LONDON: HIS MAJESTY'S STATIONERY OFFICE
1949

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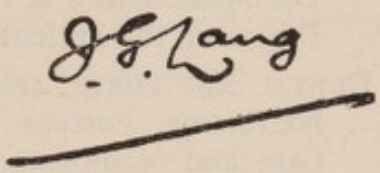
B.R. 888(D), *Handbook for Royal Naval Dental Surgery Attendants*, having been approved by My Lords Commissioners of the Admiralty, is hereby promulgated for information and guidance.

By Command of Their Lordships,



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INTRODUCTION

The Dental Surgery Attendant must realize that to him has been entrusted a position in the noble mission of healing.

Many of his duties may appear to him neither interesting, important nor heroic, but he is never to forget that the successful treatment of the dental patient, and the ease and rapidity with which the dental surgeon handles his cases, depend in large measure on the Dental Surgery Attendant's efficiency, and that slackness or failure may have serious consequences for the patient, resulting even in death.

Much of the dental surgeon's work is of great value to the general surgeon and physician alike, in ridding the patient of an infection which may be tipping the scale between health and chronic disease, or between life and death.

The Dental Surgery Attendant may feel satisfied, therefore, that if he carries out his duties conscientiously, he deserves well of his fellows ; and that the saving of life is by no means confined to heroic deeds in action.

His ambition must be to serve the sick and suffering to the utmost of his ability, and his reward the satisfaction of having given of his best to a worthwhile task.

HISTORY OF THE ROYAL NAVAL DENTAL SERVICE

1892. Staff Surgeon Canton, a medical officer, began minor dental work at R.N. Hospital, Haslar.

1899. Staff Surgeon Weightman and Staff Surgeon Capps were detailed to instruct newly entered medical officers in dental surgery, who were later expected to carry out any necessary dental treatment on board ship.

1900. Mr. Sidney Garne, L.D.S., was nominated to give instruction at R.N. Hospital, Haslar, to medical officers. This arrangement was later extended and he was requested to proceed on board certain of H.M. Ships to give similar instruction to the ships' medical officers.

1904. With the growing realization of the importance of dental treatment, a limited number of civilian dental surgeons were appointed in 1904 for full-time duties at certain shore establishments. Their appointments were on a monthly basis, later extended to a yearly agreement. Some of these dental surgeons, however, were required to go to sea with the Fleet from Portland to Northern Waters during manoeuvres.

1915. Shortly after the commencement of the First World War, 1914-18, civilian dental surgeons serving afloat were granted temporary commissions in the R.N.V.R. as Temporary Dental Surgeons. Those serving ashore continued to be employed as civilian dental surgeons. Those granted commissions wore the scarlet of the medical officer, as there was no distinguishing colour for dental officers at this time.

1918. In February, 1918, the orange distinguishing colour was introduced for dental officers. Later in the year temporary commissions were granted to civilian dental surgeons serving ashore. In October all non-executive officers had their rank titles altered and Temporary Dental Surgeons, R.N.V.R. became Temporary Surgeon Lieutenants, R.N.V.R. The curl on the rank lace and the officer's cap badge as now worn, which formerly were applicable to executive officers only, became common to all branches. In November the designation (D) was introduced and dental officers became known as Temporary Surgeon Lieutenants (D) R.N.V.R. At the time of the signing of the Armistice 85 dental officers in this rank were serving, of whom five were awarded the O.B.E. Many returned to civilian life after the war.

During the 1914-18 war the duties of dental surgery attendants afloat were carried out by Sick Berth Staff lent for this purpose.

1920. In 1920 the Royal Naval Dental Service was instituted by the transfer of 24 Temporary Surgeon Lieutenants (D) R.N.V.R. to permanent commissions in the Royal Navy, their former war service being allowed to count in full towards seniority. No allowance was made for promotion higher than Surgeon Lieutenant Commander (D) R.N., which rank was obtainable after six years total service.

Surgeon Lieutenant (D) E. E. Fletcher, O.B.E., R.N., was appointed as Dental Assistant to the Medical Director-General of the Navy.

On 5th August, 1920, the first promotions to Surgeon Lieutenant Commander (D), R.N. were made—that is, all dental officers were promoted whose total war service, either as officers or civilians dated back to the beginning of the war, 4th August, 1914, and who had, therefore, attained six years' seniority. Service before the war was not allowed to count.

1921. On 1st January, 1921, the Dental Assistant to the Medical Director-General was promoted to Surgeon Commander (D).

Dental surgery attendant duties afloat were carried out by Sick Berth Staff lent for this purpose, while in shore establishments these duties were carried out by pensioners, ex-sick berth staff, who were engaged in a civilian capacity. Dental mechanical work was undertaken by civilian dental mechanics employed in naval dental laboratories.

1922-24. The number of dental officers was increased to 60.

1926. The Dental Assistant to the Medical Director-General was promoted to Surgeon Captain (D) and the Senior Dental Officers in the three home ports were promoted to Surgeon Commander (D). The number of dental officers was increased to 64.

1932. The three Surgeon Commanders (D) in the home ports were appointed as Port Dental Officers.

1935. Conditions in the Medical and Dental Branches of the Navy were generally improved. The three Port Dental Officers were promoted to Surgeon Captain (D) making a total of four Surgeon Captains (D) in all, while the number of Surgeon Commanders (D) was increased to 15. The total number of dental officers allowed was also increased.

Prior to 1935, dental officers were admitted to the Permanent List on entry, but in this year a scheme of Short Service was instituted under which dental officers had to serve before being selected for the Permanent List.

Dental surgery attendants in shore establishments continued to be civilian pensioners ex sick berth staff, while afloat these duties were still carried out by sick berth staff lent for this purpose. Dental mechanics were civilians employed by the Admiralty as formerly.

1940. With the advent of the Second World War the Royal Naval Dental Service expanded considerably to meet the increased commitments necessitated by wartime conditions and a rapidly increasing Navy. Many retired dental officers were recalled and a large number of civilian dental surgeons were called up for war service as Temporary Surgeon Lieutenants (D) R.N.V.R. By the end of the war the total number of dental officers exceeded 700.

To meet additional requirements, a number of Acting Surgeon Commanders (D) were allowed for the first time early in 1940.

It became necessary in July, 1940, to establish two special uniformed branches within the Sick Berth branch, one of dental surgery attendants to be known as Sick Berth Attendants (D), and the other of dental mechanics to be known as Sick Berth Attendants (DM). These branches were composed entirely of personnel entered for war service and were not open to those seeking regular engagements. Many members of these branches became senior ratings before the end of the war. A limited number of Warrant Wardmasters were

appointed from the sick berth branch for dental duties in the large dental departments at the home ports during the course of the war, and one, Mr. May, was promoted to Commissioned Wardmaster shortly after the war while engaged in these duties.

In October, 1940, the title of Dental Assistant to the Medical Director-General was altered to Deputy Director-General for Dental Services.

In November, 1940, the number of confirmed Surgeon Commanders (D) R.N. was increased to 24.

1942. In December, 1942, Port Dental Officers were appointed on the staffs of the Commanders-in-Chief of the home ports as Command Dental Surgeons and they were made responsible for the administration of the dental services in the respective commands.

The term Senior Dental Officer was altered to Senior Dental Surgeon to avoid the confusion that might arise with other short titles if " S.D.O." were used.

1943. To meet additional requirements, a limited number of Acting Surgeon Captains (D) R.N. was allowed for the first time in February, 1943.

In June, 1943, the then Deputy Director-General for Dental Services was granted the acting rank of Surgeon Rear-Admiral (D) while holding this appointment, and was granted the war substantive rank on retirement in February, 1946.

1945-46. With the end of the Second World War and the demobilization that followed, the Royal Naval Dental Service gradually reduced its numbers to about a third of its war strength. The majority of the R.N.V.R. Dental Officers and the Sick Berth Staff (D) and (DM) who had joined for war service returned to civil life.

A small proportion of R.N.V.R. Dental Officers transferred to the Royal Navy, but the transfer of dental ratings to regular engagements was not allowed for.

PART I.

THE DENTAL TISSUES IN HEALTH AND DISEASE

CHAPTER 1

DENTAL ANATOMY

GENERAL

THE dental surgeon is more properly an oral surgeon, inasmuch as he deals not only with the teeth but with the surrounding structures, and is responsible for the health of the mouth tissues generally.

In order that the dental surgery attendant may perform his professional duties with intelligence, some knowledge of the anatomy of the mouth, together with some elementary pathology and bacteriology, are desirable.

The mouth or **oral cavity** is the entrance to the **alimentary canal,** which consists of mouth, pharynx, oesophagus or gullet, stomach, small and large intestine or bowel.

The mouth is a cavity formed by the upper jaw or **superior maxilla,** the lower jaw, or **inferior maxilla** or **mandible,** and the various structures, such as muscles, etc., which connect them and form the lips, cheeks and floor of mouth. Both jaws have a roughly semi-circular ridge of bone, the **alveolar process,** in which the teeth are set.

The mouth is almost entirely filled by the **tongue,** a highly specialized mass of muscle, which has on its upper surface the taste-buds by which we savour our food. It has also a very delicate sense of touch and of temperature. It can be moved in any direction and can assume an infinite variety of shapes, thus enabling it to take part in speech, chewing, swallowing, detecting rough particles in food, guarding against too hot food and drink, and keeping the teeth and mouth clean.

The mouth and tongue are covered by **mucous membrane.** This secretes mucous, which acts as a lubricant. The membrane covering the alveolar process is thick and tough, and is called the **gum.**

In addition to mucous another fluid is poured into the mouth, the saliva. This is secreted by three pairs of **salivary glands :—**

(1) the **parotid glands,** which lie in the cheeks just in front of, and below the ears, each having a duct **(Stenson's duct)** which opens into the mouth opposite the upper second molars ;

(2) the **submaxillary glands,** situated below the lower jaw in the molar region, on either side of the mid-line, each having a duct **(Whartons duct)** which opens on the floor of the mouth under the tongue ; and

(3) the **sublingual glands,** which lie in the floor of the mouth behind the incisor teeth, with a number of small ducts opening on the floor of the mouth under the tongue.

Saliva moistens the food, and also takes part in the digestive processes by acting on starchy food. Normal saliva is alkaline and helps to neutralize acids.

At the back of the mouth, one on each side, each lying between two folds known as the **pillars of the fauces,** are the **tonsils.** The action of these sponge-like glands is probably protective, but they often become themselves seats of infection and, like two dirty sponges, are in this state more of a danger than a help.

Like a curtain at the back of the roof of the mouth, or **hard palate,** hangs the **soft palate,** forming the **uvula** in the middle of its lower border. The soft palate directs food and drink downwards.

THE TEETH

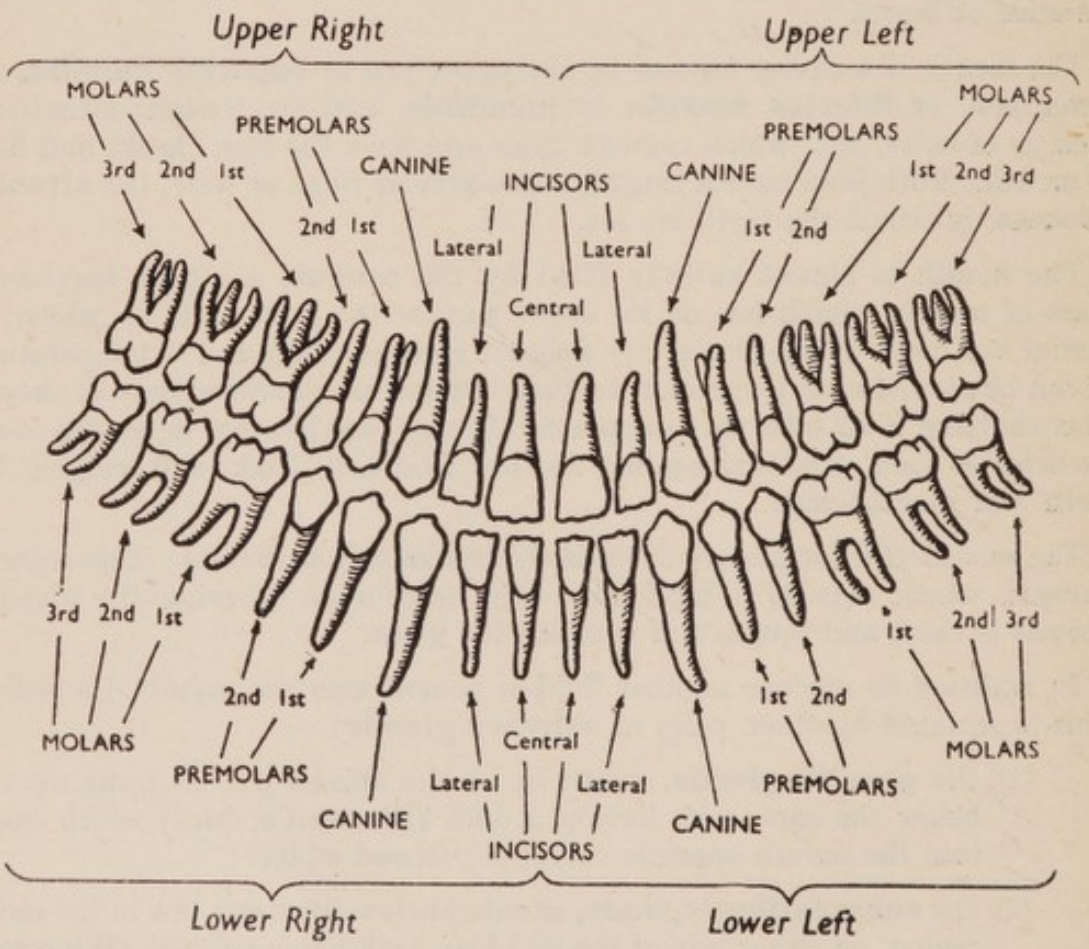


Fig. 1.—Permanent Teeth, Classification

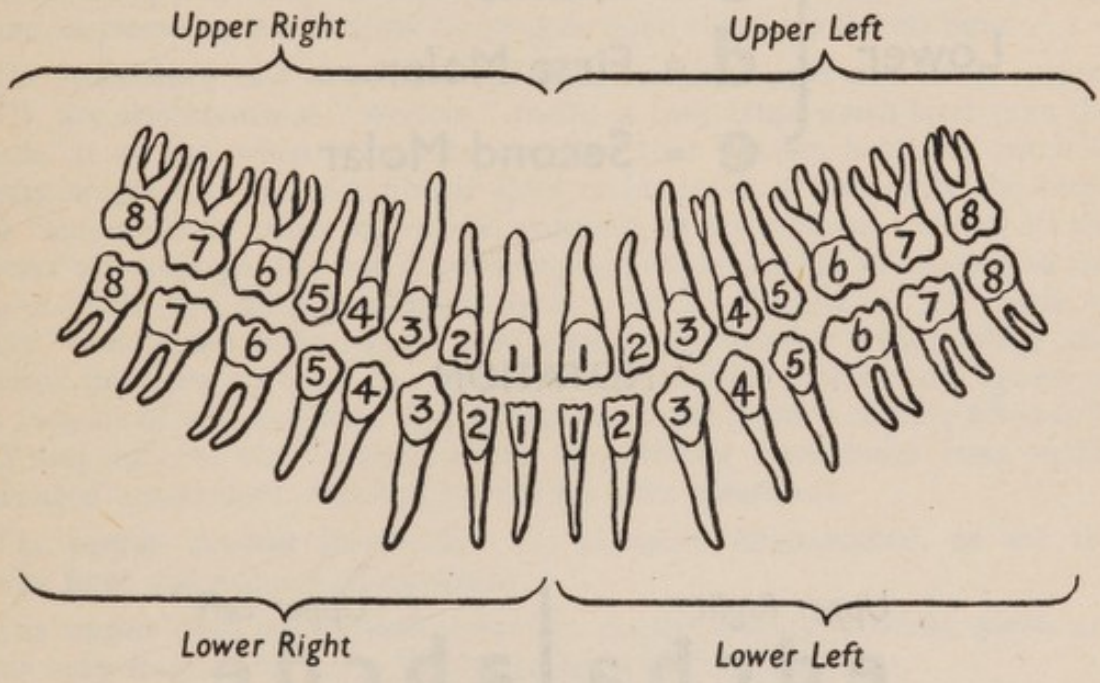
The teeth are set in the upper and lower jaws in semi-circular bony ridges, known as the alveolar processes. It is here also that they develop, bone being laid down around the roots as they form, thus making the sockets. The upper jaw is fixed, the lower is freely movable. The teeth in adult man are 32 in number, 16 above and 16 below. These are known as **permanent teeth,** as distinct from the first set of **temporary teeth** which are shed in childhood and are 20 in number.

Normally, when the jaws are closed the teeth come together in such a way that each tooth makes contact with two others (except the upper third molar and lower central incisor). This is called **normal occlusion** or **articulation.**

Permanent Teeth

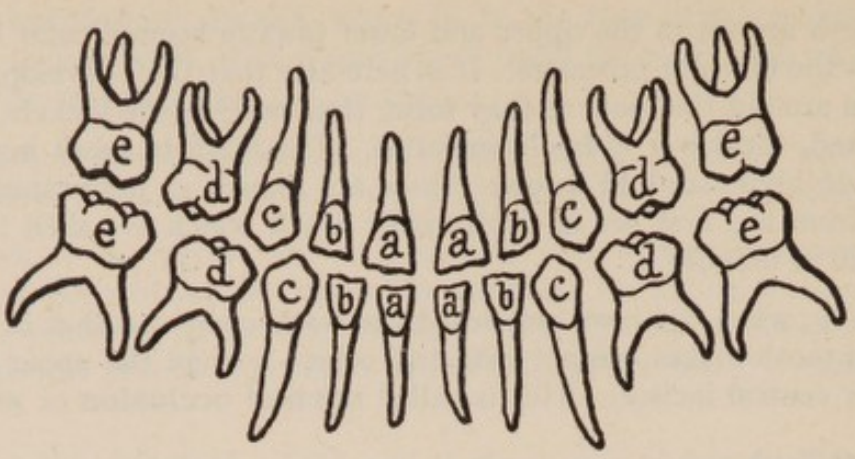
The permanent teeth are classified as follows, and are in each case in pairs, left and right :—

(*a*) **INCISORS** (Cutters) ... ... 8 in number
2 Upper **Central** Incisors
2 Lower ,, ,,
2 Upper **Lateral** Incisors
2 Lower ,, ,,



Upper Right	Upper Left
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
Lower Right	Lower Left

Fig. 2.—Permanent Teeth, Notation



Upper and Lower

a = Central Incisor
b = Lateral Incisor
c = Canine
d = First Molar
e = Second Molar

NOTATION

Upper Right	*Upper Left*
e d c b a	**a b c d e**
e d c b a	**a b c d e**
Lower Right	*Lower Left*

Fig. 3.—Temporary Teeth

(*b*) **CANINES** (Dog or Eye Teeth) ... ... 4 in number
2 Upper Canines
2 Lower ,,

(*c*) **PREMOLARS or BICUSPIDS** ... ... 8 in number
(coming before the molars—having two cusps)
2 Upper **First** Premolars
2 Lower ,, ,,
2 Upper **Second** Premolars
2 Lower ,, ,,

(*d*) **MOLARS** ... ... 12 in number
(grinders, from the Latin " Mola "—a Mill)
2 Upper **First** Molars
2 Lower ,, ,,
2 Upper **Second** Molars
2 Lower ,, ,,
2 Upper **Third** Molars
2 Lower ,, ,,

Mandibular molars normally have two roots, whereas **maxillary molars** have three. Nevertheless, the former are usually more firmly implanted owing to the denser nature of the bone surrounding their roots, and their removal frequently calls for surgical technique, such as cutting away a portion of the surrounding bone, either by gouges, bone chisels or dental burs.

The **maxillary** and **mandibular third molars,** upper and lower respectively, are also known as " wisdom " teeth, as they erupt much later than the others, at an age when it may be assumed that wisdom has been reached. Faulty eruption of the mandibular third molar tooth is frequently the cause of a comparatively major operation, required for its removal. Owing to the process of evolution, the jaw is becoming relatively smaller in relation to the size of teeth, and often insufficient room is left in the jaw for this tooth to erupt. Should this occur, severe pain may result, together with swelling and trismus (inability to open the mouth, owing to inflammation and spasm of the muscles of mastication). The extraction of the tooth is usually necessary, and may involve the removal of the surrounding mandibular bone under prolonged anaesthesia, followed by careful after treatment.

The **upper second premolars** are normally single-rooted, as are the **lower first** and **second premolars.**

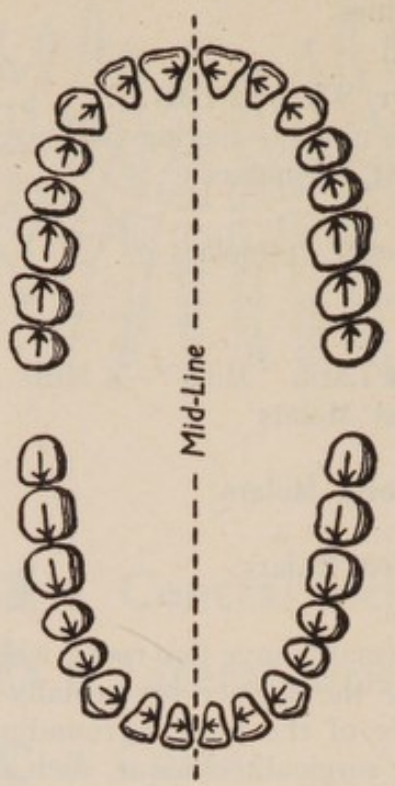
The **upper first premolars,** however, usually have two roots, which are often very fragile and easily fractured during extraction.

The **canines** are long, strong and single-rooted, and are very firmly implanted in the bone.

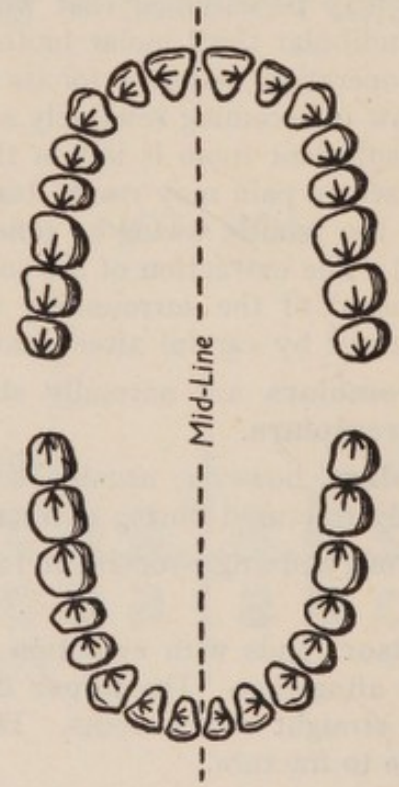
The **upper lateral incisor** tends with evolution to become smaller, and is not infrequently absent altogether. The **upper central incisor** is much larger. Both have simple straight conical roots. The **lower incisors** have flattened fragile roots liable to fracture.

Temporary Teeth

The first set of temporary teeth, sometimes called " milk teeth," consists of incisors and canines, but there are no premolars, and only two instead of

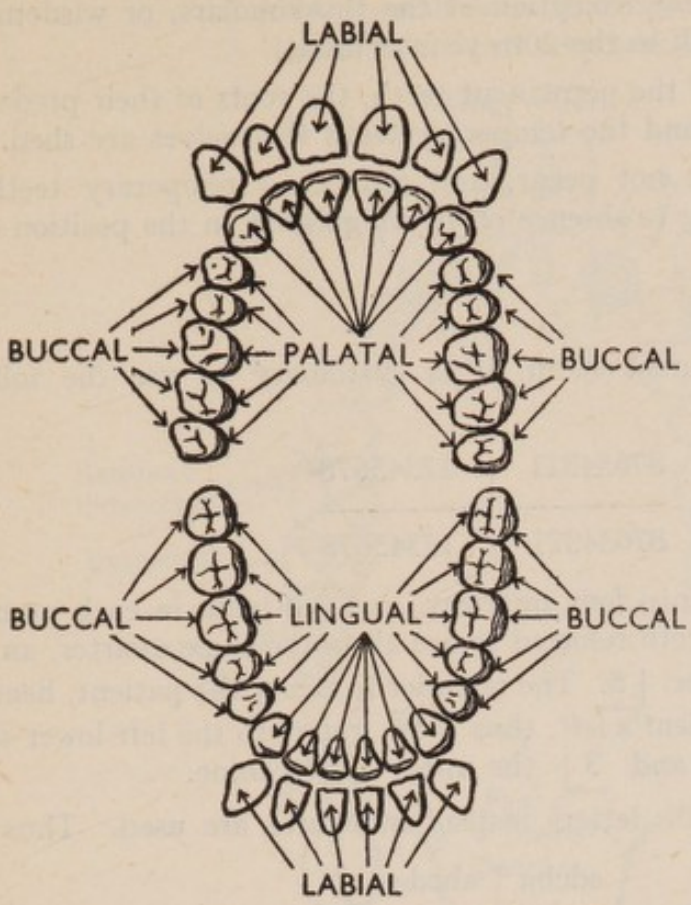


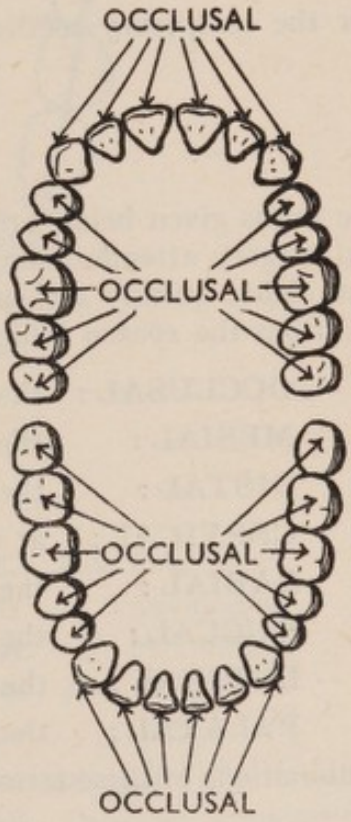
MESIAL — *(Towards the Mid-Line)*



DISTAL — *(Away from the Mid-Line)*

Fig. 4.—Surfaces of the Teeth





Reference :—

Buccal	–	*Cheek*
Labial	–	*Lip*
Palatal	–	*Palate*
Lingual	–	*Tongue*
Occlusal	–	*Biting*

Fig. 5.—Surfaces of the Teeth

three molars. The teeth appear between the 6th and 30th months, and are replaced by the second or permanent set of teeth, which erupt from the 6th to the 12th year (with the exception of the third molars, or wisdom teeth, which erupt from the 16th to the 20th year or later).

During the eruption of the permanent teeth, the roots of their predecessors are gradually absorbed, and the temporary teeth themselves are shed.

Occasionally this does not occur, and individual temporary teeth may persist. This is usually due to absence of, or irregularity in the position of, the permanent successors.

Recording

In referring to permanent teeth, it is customary to use the following symbols :—

87654321	12345678
87654321	12345678

The mouth is divided into four quarters, and the teeth in each numbered from the centre. If the teeth referred to are all in the same quarter, an angle only is used thus $\overline{731}|$ or $|\underline{5}$. The recorder is facing the patient, hence the recorder's right is the patient's left, thus $\lceil\overline{56}$ refers to the left lower second premolar and first molar, and $\underline{3}\rfloor$ the upper right canine.

For the temporary teeth, letters instead of figures are used. Thus :—

edcba	abcde
edcba	abcde

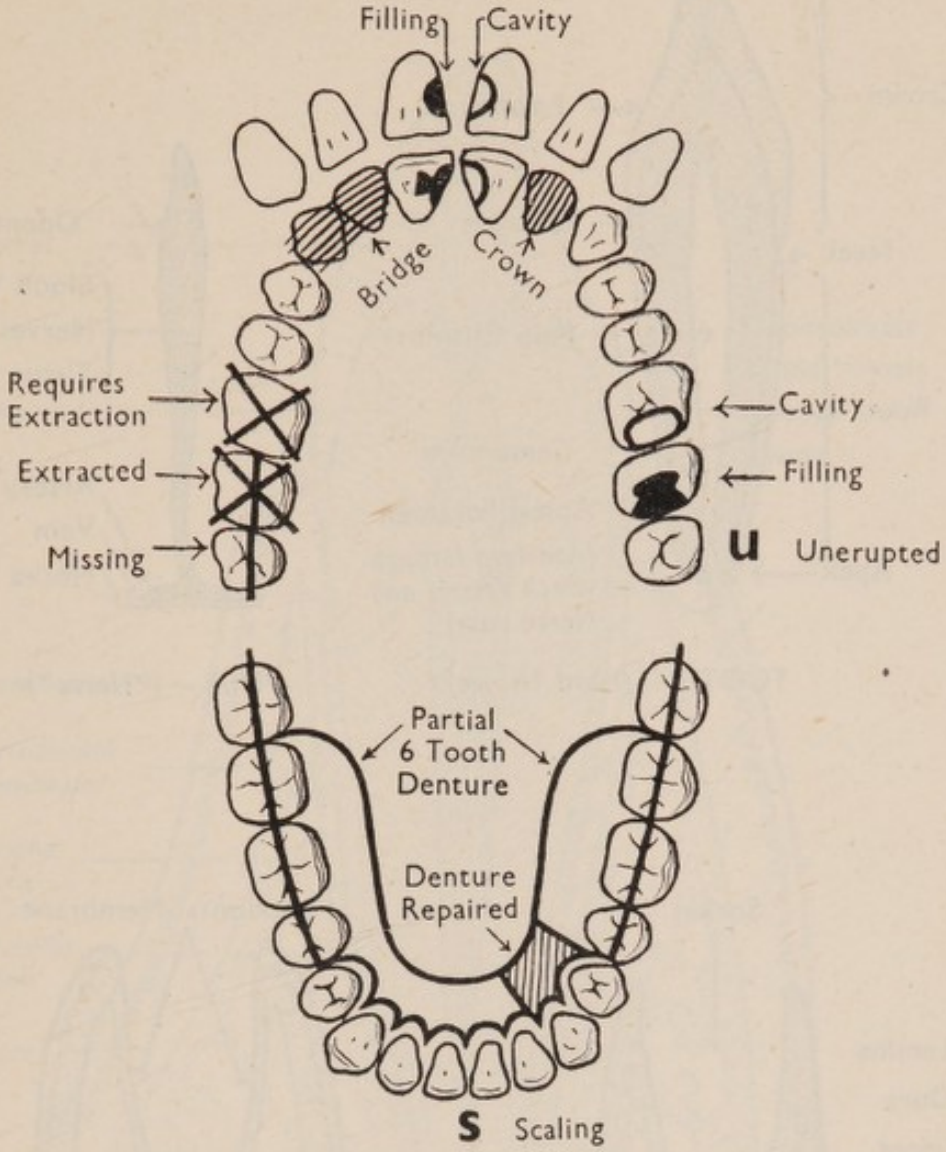
The terms given below are used to denote the surfaces of a tooth, and the dental surgery attendant must be familiar with their meaning, in order that he can chart, quickly and accurately, the position of a cavity or filling in a tooth, from the *spoken* information given by the examining dental officer.

OCCLUSAL : the occluding or grinding surface of the tooth.
MESIAL : the side nearest the mid-line of the mouth.
DISTAL : the side farthest from the mid-line of the mouth.
CERVICAL : at the neck of the tooth.
LABIAL : the side next the lips.
BUCCAL : the side next the cheek.
LINGUAL : the side next the tongue.
PALATAL : the side next the palate.

Combinations of these terms are also used, as follows :—

Mesio-occlusal
Occluso-distal
Mesio-occluso-distal or M.O.D.
Bucco-cervical
Cervico-palatal, etc.

A **cusp** is a peak or point on a tooth.
A **fissure** is the depression or valley between the cusps.
A **pit** is a small deep depression or cavity.
A "**pin-hole**" is a very small cavity.



Symbols

AF	Amalgam Filling	**PC**	Pulp Capped
SF	Silicate ,,	**PD**	,, Devitalized
OF	Osteoplastic Filling	**PM**	,, Mummified
Cu F	Copper ,,	**RD**	Root Dressed
D	Dressing, **Zn O** Zinc Oxide	**RF**	,, Filled
TGP	Temporary Gutta Percha	**S**	Scaling, **P** Polish
ELA	Extraction under Local Anaesthesia	**DR**	Dentures Recommended
ERA	,, ,, Regional ,,	**DA**	,, Approved
EGA	,, ,, General ,,	**DF**	,, Fitted

*(Note:- **DF** is not to be used to indicate Dentally Fit)*

Fig. 6.—Charting

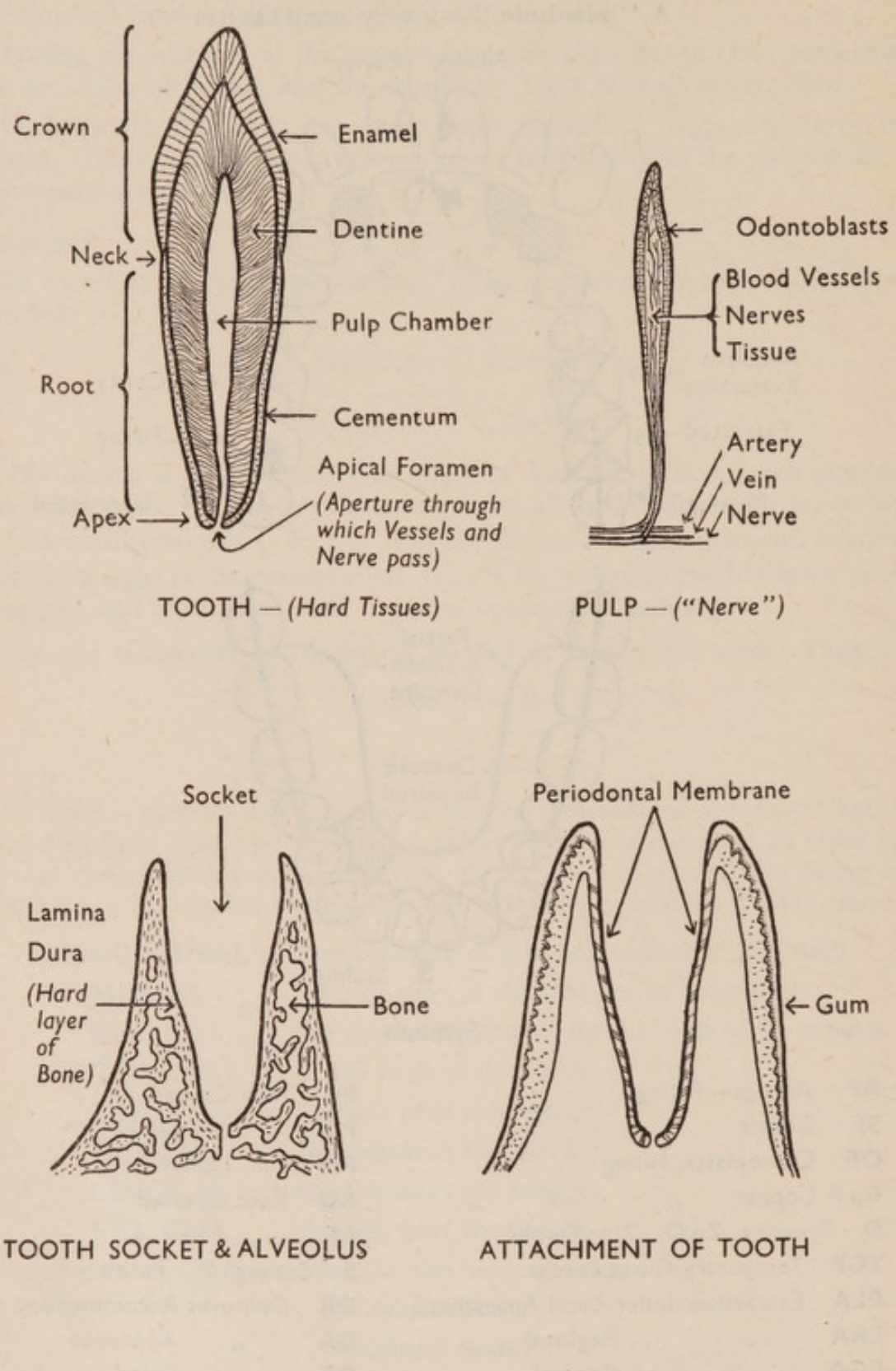


Fig. 7.—Dental Tissues
(Horizontal Section of separate parts of a Tooth and its Attachment)

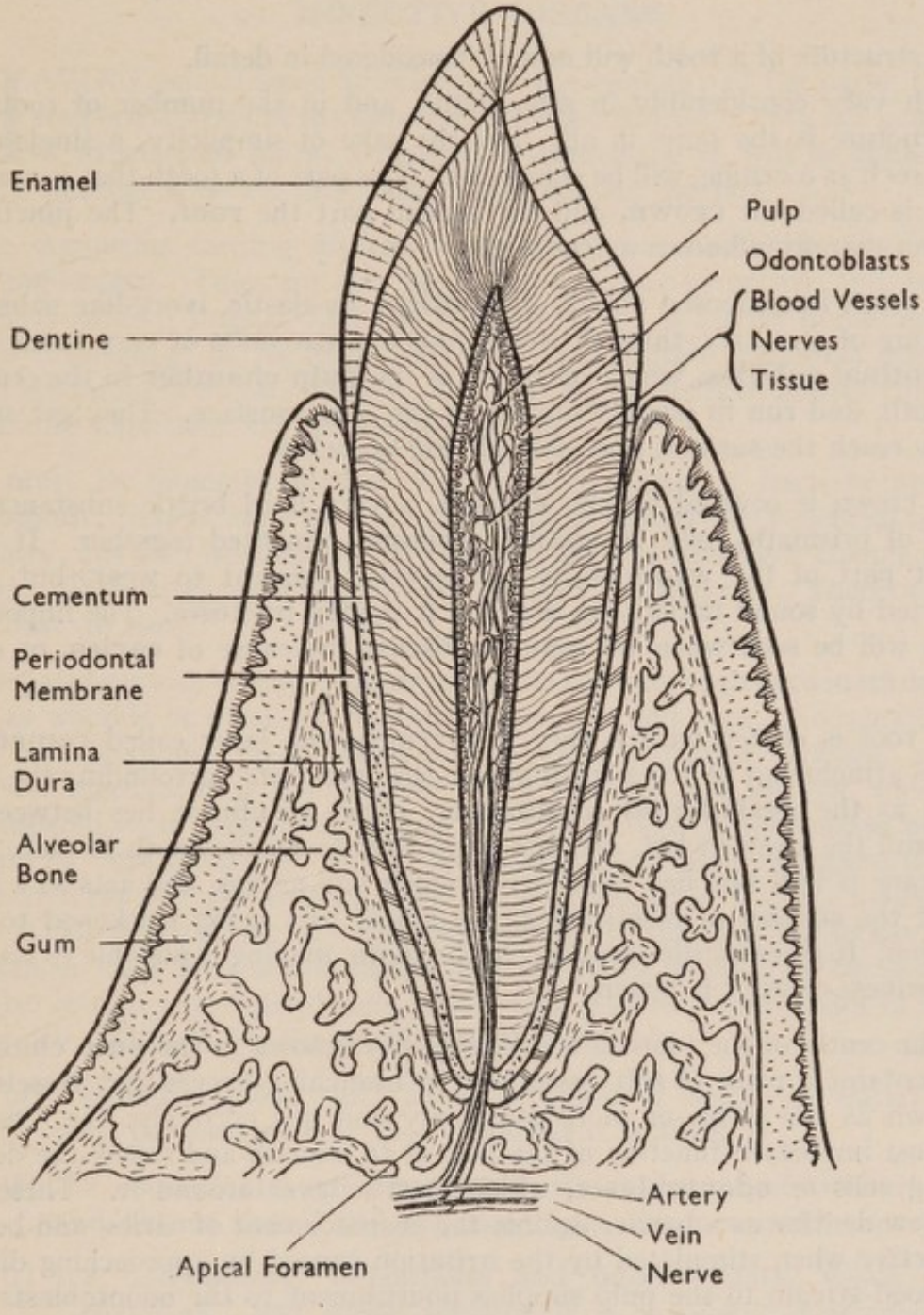


Fig. 8.—Dental Tissues
(*Horizontal Section of a Tooth and its Attachment*)

THE MICROSCOPIC STRUCTURE OF A TOOTH AND ITS SURROUNDINGS (HISTOLOGY)

The structure of a tooth will now be considered in detail.

Teeth vary considerably in size, shape, and in the number of roots, but the structure is the same in all. For the sake of simplicity, a single-rooted tooth, such as a canine, will be considered. The part of a tooth that is normally visible is called the **crown,** and the hidden part the **root.** The junction at the gum margin is known as the **neck.**

The tooth is composed mainly of **dentine,** an elastic, ivory-like substance, consisting of a matrix, through which runs a dense mass of very small tubes, the **dentinal tubules,** which open out of the **pulp chamber** in the centre of the tooth, and run in parallel curves to the outer surface. They get smaller as they reach the surface, and give off side branches.

The crown is covered by the **enamel,** a very hard brittle substance consisting of prismatic rods, or **enamel prisms,** cemented together. It is the hardest part of the whole body. It is very resistant to wear, but unless supported by sound underlying dentine, it readily fractures. The importance of this will be seen when we come to discuss the cause of **caries,** or dental decay.

The root is coated with a very thin cement-like layer called **cementum.** It gives attachment to fibres coming from the membrane surrounding the tooth, known as the **periodontal membrane.** This membrane lies between the tooth and the bony socket, and the fibres help to fix the tooth in place. The membrane is well supplied with blood vessels and nerves, and acts as a buffer against the stresses of mastication, the apical part being thickened to form a cushion. It gives tactile sensation to the tooth, making it possible to estimate the hardness of what is bitten.

In the centre of the tooth is a hollow cavity, known as the **pulp chamber.** This contains a mass of soft tissue rich in branching nerves and vessels, and is known as the **pulp,** or more commonly and less correctly, the "nerve." The most important function of the pulp is to nourish and renew the dentine forming cells or **odontoblasts,** which form a layer around it. These cells form new dentine as a barrier against the encroachment of caries, and become very active when stimulated by the irritation caused by approaching disease. The blood stream to the pulp supplies nourishment to the odontoblasts from its plasma, and oxygen from its red corpuscles, and conveys to the scene of action those white cells known as **phagocytes,** whose function it is to attack invading **bacteria.**

CHAPTER 2

GENERAL PATHOLOGY

INFECTIVE DISEASE

HAVING gained some knowledge of the anatomy of the parts, the next step is the study of the nature of infective disease, a very fair conception of which, and nature's method of combating it, will be gained if we draw a parallel between this conflict and modern warfare.

The organisms causing disease, the **pathogenic bacteria,** represent the invading enemy. They are also known as microbes or germs, and are often popularly called " bugs." This last term, of course, is merely humorous slang, and is misleading, as bacteria are really very minute vegetable organisms, which are found in infinite variety, and have the property of multiplying under favourable conditions into countless millions.

It must be remembered that the great majority of bacteria are **non-pathogenic,** that is, they do not cause disease. Many are beneficial not only to health, but also because of the part they play in causing a change in dead matter. Without them, a dead body could not disintegrate. There would be no " dust to dust."

The pathogenic or enemy bacteria enter the body through gaps in its defences, such as wounds or sores, or through the mouth and nose. Fortunately, the body is exceedingly highly organised to resist bacterial invasion, and the defensive mechanism is immediately set in motion. The **nerves,** which may be compared with " communications," send a message to the **central nervous system** or " headquarters," and in response an extra supply of **blood** is rushed to the area through the arteries. This blood contains not only the nourishment and oxygen required for the maintenance of the tissues—the former in the **plasma** or clear part of the blood, and the latter in the **red corpuscles**—but also contains specialized cells, which take part in the processes of defence and repair. These cells, the **white cells,** consist of :—

(*a*) the **phagocytes,** which have the power of destroying bacteria, and may be compared to the " combatant soldiers " ;

(*b*) the **osteoclasts** and **fibroclasts,** which get rid of unwanted bone and fibrous tissue, and act as a " demolition squad " ; and

(*c*) the **osteoblasts, fibroblasts** and **odontoblasts,** which act as " engineers," and whose function it is to rebuild destroyed bone, fibrous tissue and dentine.

It will be understood, therefore, that this extra concentration of blood, which we recognize as **inflammation,** is not in itself a disease, but really part of the cure. It is often desirable to increase inflammation by foments, but sometimes, when the natural inflammation is out of proportion to requirements, it may be necessary to reduce it by ice-packs, in order to lessen the associated swelling and soreness.

If living organisms succeed in invading the blood-stream itself, a very grave condition known as **septicaemia** results. Fortunately this condition is rare, but bacteria produce poisonous by-products called **toxins,** which do succeed in getting into the blood-stream in greater or lesser degree, and which are very harmful to health. The body, however, is furnished with a drainage system consisting of the **lymphatic vessels** which, usually following the course of the arteries and veins, join, branch and ultimately drain into the thoracic and right lymphatic ducts, which empty in turn into the jugular veins, and so back to the heart.

The lymphatics collect the excess lymph, which has come from the blood to feed the body cells, and also the phagocytes and other white cells, which have left the blood-stream to defend and rebuild the tissues. At intervals, in the course of these lymphatics, are found glands which are concerned in the production and renewal of the white blood cells. These **lymphatic glands** contain concentrations of white cells, and therefore take a very active part in " mopping up " the toxins and organisms which find their way into the system. When infection is present, these glands become increasingly active and enlarged, and may even break down under the strain. If this occurs, infection will proceed to the next barrier. It is common knowledge that a cut finger may result in swelling of the lymphatic glands in the armpit. The swelling and inflammation of these glands is called **adenitis.** An inflammation of a lymphatic vessel itself, known as **lymph-angitis,** is often indicated by a red line. This is a danger signal which points to a virulent infection.

Fortunately, the defences are so powerful in a healthy subject that the invader is overcome—the severity of the struggle varying with the potency of the infection. As the result of such a struggle, the body forms **anti-bodies** or **anti-toxins** against the particular infection concerned. They may be compared to " commandos," who are specially equipped for dealing with one particular enemy.

In these circumstances, an **immunity** to the particular disease is brought about. It is this principle which is used in **vaccination** and **innoculation,** a sufficient quantity of poison being artificially introduced into the body to produce these anti-toxins, without actually causing the disease. Some individuals appear to possess a natural immunity to certain diseases.

BACTERIOLOGY

Bacteria or germs are of infinite variety, and vary greatly in their vitality. Some die quickly if they are removed from favourable conditions of growth ; others may be readily killed by heat or cold, or by the use of chemical substances known as **disinfectants.** Some bacteria, such as tetanus and anthrax, are very resistant and often form **spores,** which may lie dormant for long periods in dust and dirt, ready to spring to life when conditions become favourable. A single organism forms only one spore, and this, like a chrysalis, represents a resting-stage in the life cycle of the organism. Spores are very difficult to destroy, and may survive the ordinary methods of sterilization.

Bacteria may be classified according to their shape, the study of which is known as **morphology,** and according to this classification they are known by the following names :—

COCCI	Individual dots.
STREPTOCOCCI	Dots in chains.
STAPHYLOCOCCI	Dots in bunches like grapes.
BACILLI	Rods, curved or straight.
SPIROCHAETES	Spiral rods.
SPIRILLAE	
FLAGELLA	Rods with whip like attachments.
LEPTOTHRIX	Curved branching rods.
STREPTOTHRIX	

Note.—Tetanus bacilli are rod shaped, but when possessed of spores, look like drum-sticks.

Bacteria are also classified according to their **reaction to oxygen,** as follows :

AEROBES	Those requiring free oxygen to support life.
ANAEROBES	Those which cannot live in the presence of free oxygen.
FACULTATIVE ANAEROBES	Those which thrive whether free oxygen is present or not, and which represent the majority.

Another classification depends on the organisms' **reaction to staining processes** :—

GRAM POSITIVE	Those which can be stained by Gram's method of staining.
GRAM NEGATIVE	Those which cannot so be stained.

The bacteria with which we are mostly concerned are those associated with diseases of the teeth and gums. Those which play a part in **caries,** or dental decay, fall into two main groups :—

1. **Acid Forming Bacteria**
   - Streptococcus Brevis
   - Staphylococcus Albus
   - Bacillus Necrodentalis

2. **Proteolytic Bacteria**
   - Bacillus Subtilis
   - Bacillus Proteous Vulgaris
   - Bacillus Gingivae Pyogenes

The first group destroys the inorganic material of the teeth by the acids they form, leaving the second group free to destroy the organic material that remains.

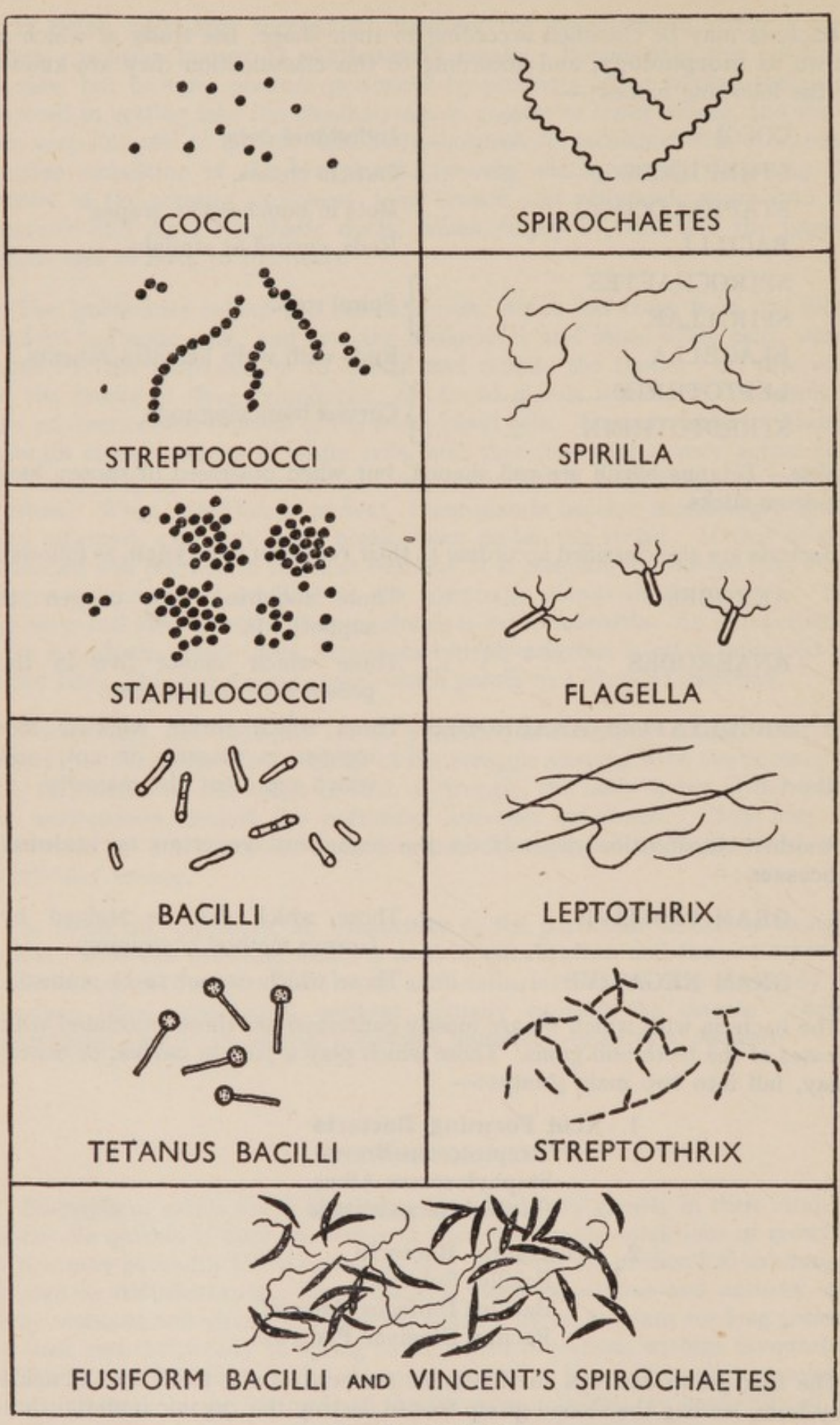


Fig. 9.—Bacteria

Bacteria which are associated with alveolar abscesses are pus forming or **pyogenic.**

Pyogenic Bacteria

Staphylococcus Aureus
Staphylococcus Albus

Most inflammatory mouth conditions are found to contain the **micrococcus catarrhalis** in large numbers, while in acute ulcerative gingivitis, or Vincent's disease, the flask-shaped **Fusiform Bacillus** is found in association with the **Vincent's Spirochaete** in large numbers.

Although there is some difference of opinion as to whether these latter organisms are the actual causative factor in Vincent's disease, smears are often taken from the gums, to discover microscopically whether these organisms are present, and in what concentration. The examination is regarded as a valuable indication of the intensity of the disease and the progress of the cure.

Positive presence is indicated by the plus sign +, while absence is indicated by the negative sign −. The number of organisms may be indicated by ++ or +++, as a guide to the severity of the condition.

VACCINE THERAPY

Smears may be taken from the gums and pockets around the teeth in order to prepare a **vaccine** for the treatment of pyorrhoea.

Infected material, taken from the pockets around the teeth, is placed in a test tube on a medium suitable for bacterial growth, and subjected to heat at body temperature. The bacteria grow on the medium in the form of individual colonies, which are visible to the naked eye. These are then separated, each colony being replanted on suitable media, and the process repeated, until a pure culture of the organism required is obtained. The pure culture is then sterilized, and the dead bacteria made into a vaccine for injection into the patient. The vaccine, composed of dead bacteria and their toxins, causes increased formation of the appropriate **anti-bodies** in the blood to fight the disease.

A vaccine, prepared from a culture obtained from the patient himself, is known as an **"autogenous vaccine."** A **"stock vaccine,"** made from bacteria taken from a similar condition to the one being treated, may be used, but is not considered so satisfactory.

AGGLUTINATION TEST

Bacteria may be cultured from the apex of a freshly extracted tooth, in order to determine whether these organisms are associated with any general disease from which the patient is suffering. The cultured bacteria are then used in what is known as the **agglutination test.** This test depends on the fact that the blood serum has the property of forming the bacteria, against which it is immunized, into clumps, owing to the formation of an anti-body called **agglutinin.** Hence, if the patient's blood serum will "agglutinate" the bacteria that have been cultured, it is fairly certain that they have been responsible for infecting the whole blood-stream with their toxins, and this will influence us in our opinion as to the advisability of removing the teeth concerned.

CHAPTER 3

THE PATHOLOGY OF DENTAL DISEASE

GENERAL REMARKS

BY **pathology** is understood the study of disease. This includes all the processes involved in the destruction and repair of the tissues concerned in invasion and defence.

Dental diseases may be divided into two main groups, (A) those involving the tooth itself, and (B) those involving the surrounding structures, namely, the gum, the periodontal membrane and the surrounding bone.

Group A includes **dental caries,** which commences with the decalcification and destruction of the enamel of the tooth, followed by decay of the underlying dentine, and **pulpitis** or inflammation of the pulp, leading all too frequently to its death.

As a direct consequence of caries and pulpitis, the surrounding structures become involved, resulting in **periodontitis,** or acute inflammation of the periodontal membrane (the membrane surrounding the root of the tooth). This infection may lead in turn to **alveolar abscess**—that is an abscess involving the body of the jaw. Such an abscess usually succeeds in breaking through the outer bony plate of the jaw, on the buccal (cheek) or labial (lip) aspect of the bone. As periodontitis and alveolar abscess are the direct result of group A diseases, they belong more properly to this group than to group B, although they affect the surrounding structures.

Group B comprises diseases affecting the structures surrounding the teeth. It includes all those degrees of inflammation affecting the periodontal membrane which are grouped under the general term **paradontitis,** from simple **gingivitis,** which is an inflammation of the gingivae or gum at the neck of the teeth, to true **pyorrhoea,** which means a " flow of pus," and results from chronic inflammation of the periodontal membrane and the bony tooth socket, causing their gradual destruction and the loosening of the tooth.

The words paradontal and periodontal both mean " around the tooth," but the first is derived from the Greek, and the second from the Latin. Paradontitis and periodontitis, therefore, both mean inflammation of the periodontal membrane, but whereas periodontitis is reserved to indicate an inflammation of the periodontal membrane only (usually of an acute nature), the term paradontitis is used to cover those conditions (usually chronic) which involve not only the periodontal membrane but the adjacent structures as well.

In paradontal disease the teeth in themselves are very often quite free from caries, and have healthy live pulps.

The events which lead to these diseased or morbid conditions will now be traced in more detail.

A. DISEASES OF THE TOOTH

(Caries, Pulpitis, Periodontitis, Alveolar Abscess)

Dental Caries commences with the destruction of the tooth enamel. Tooth enamel is constructed almost entirely of lime salts. The decalcification and decay of enamel consists in the dissolving of these salts by acids, formed as the result of bacterial activity on accumulated food debris. The material between the enamel prisms disappears first, and enamel thus attacked becomes opaque and has a chalky appearance. The process of destruction goes on, until sooner or later the dentine is reached.

The decay of dentine is much more rapid than the destruction of the enamel, owing to their different nature and structure. The **acid forming bacteria** enter the dentinal tubules, and there multiply and advance towards the pulp. The acids they form dissolve the salts of the surrounding dentine, causing the disappearance of the tubules, and the formation of larger and larger spaces. The **proteolytic bacteria,** which are capable of liquifying protein with the toxins they produce, are now able to dissolve the organic part of the dentine, so that the entire substance becomes disintegrated.

As the destruction of dentine is much more rapid than that of the enamel, the latter structure becomes undermined and, being brittle, sooner or later suffers a sudden collapse, through lack of support from underlying sound dentine. An erroneous impression is given that the tooth has decayed very suddenly, whereas disintegration has probably been proceeding over a long period.

The importance of regular dental inspection is therefore apparent. The patient suspects nothing wrong, until such a collapse occurs, when a definite hole can be felt or seen. It may then be too late to save the all important vital pulp of the tooth.

Dental inspection by means of a sharp probe will reveal any breach in the surface or fissure of a tooth, and any loss of translucency in the enamel will be observed. Both are evidence that decay is present, and it is often found that a surprising amount of destruction has taken place, even when the damage can scarcely be detected from the outside.

As the destruction of the dentine advances towards the pulp, the odontoblasts, or dentine forming cells, which are drawn up like an army on the "frontier" of the pulp, become very active, and do their best to check the advance by laying down new dentine, to protect the all important pulp. Unfortunately the odds are usually too heavily on the enemy's side, and sooner or later a break through occurs, although the odontoblasts do sometimes succeed in laying down a protective barrier and so effect a natural or spontaneous cure.

When a break through occurs the pulp becomes invaded by bacteria, and reinforcements are urgently rushed to the area by means of an increased blood supply. The condition has now become a **pulpitis,** or inflammation of the pulp, and is characterized by great pain. This pain is caused by the confinement of the blood vessels of the pulp in a rigid space, which does not permit the normal expansion of these vessels reacting to inflammation; great pressure is therefore exerted on the nerves. If the inflammation is not

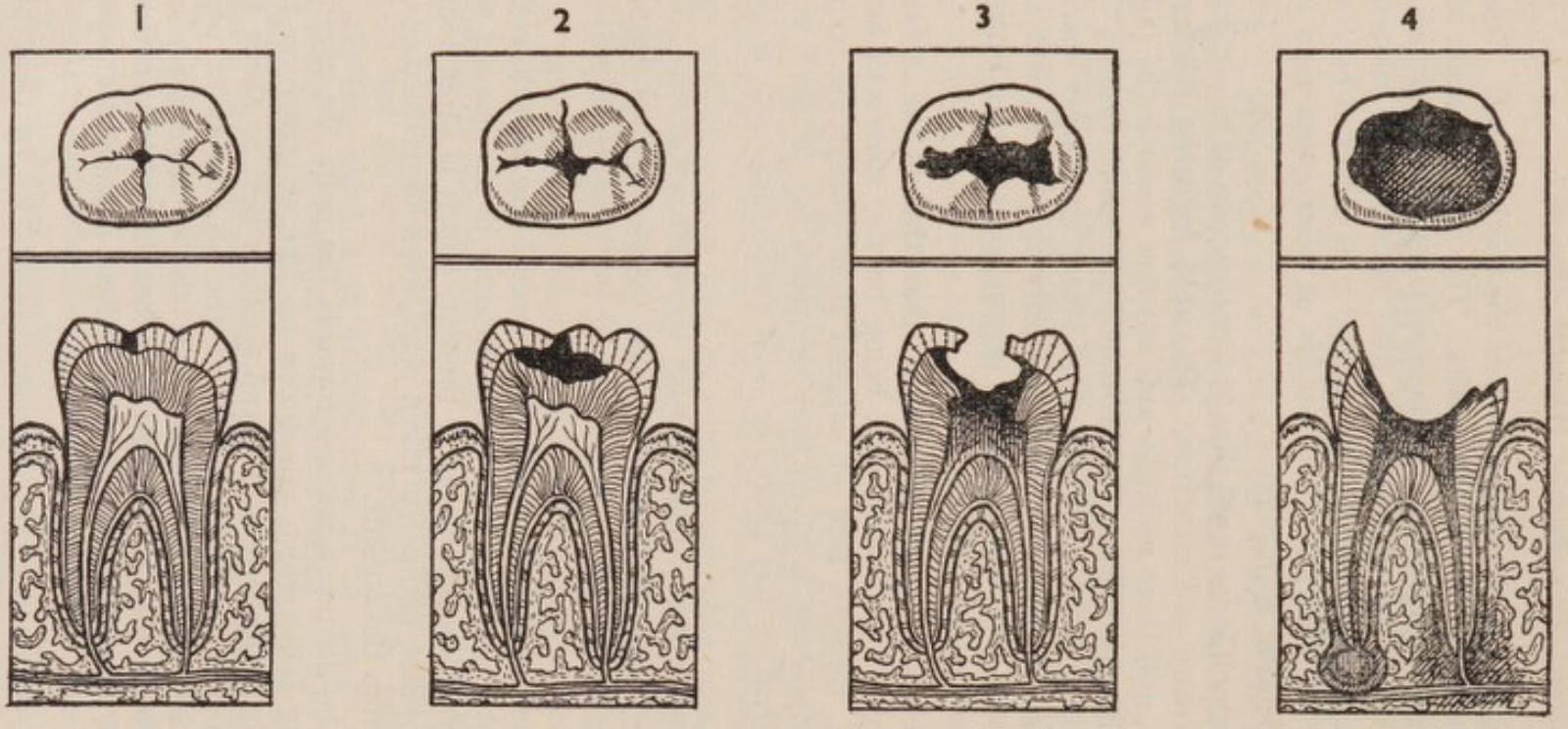


Fig. 10.—Dental Caries—Progressive Stages

rapidly relieved, the increased flow or " traffic " through the arteries and veins will cause a blockage at the tiny orifice at the tip of the root known as the **apical foramen,** through which these vessels are transmitted, and which forms a bottle-neck. A clot forms in the vessels here, and " traffic " both ways is stopped. On the one hand the blocked arteries prevent (*a*) the passage of fresh supplies of food from the plasma, and fuel from the red corpuscles in the form of oxygen, and (*b*) the arrival of reinforcements in the form of white cells or " fighting " phagocytes, and " engineering " odontoblasts. On the other hand the blocked veins and lymphatics can no longer return the " empties," namely, the red corpuscles deprived of their oxygen, neither can they carry away the waste products, such as dead cells and their poisons. The death and putrefaction of the pulp inevitably follow, with the formation of **pus,** consisting of dead and disintegrating bacteria (the enemy) and dead body cells (their opponents).

The immediate result of the death of the pulp is the cessation of pain, as the nerves now dead are incapable of conveying sensation to the brain. The patient is lulled into a sense of false security, and congratulates himself that the pain is over. However, he is living in a fool's paradise, for sooner or later the clot in the apical foramen breaks down, permitting the poisons or toxins which have been forming in the putrid pulp, and the fresh bacteria of many kinds which have taken advantage of the undefended position to invade the pulp, to seep through and come in contact with the periodontal membrane. This structure reacts by calling for an extra blood supply to defend it, the resulting inflammation being known as a **periodontitis.** The membrane is full of nerves and vessels, and as it is wedged between the unyielding alveolar bone on one side and the root of the tooth on the other, there is, as before, no room for expansion, and the resulting pain is very severe. The slightest tap or touch on the tooth may cause agony and, moreover, the tooth is slightly raised in its socket, so that it has to bear more than its share of biting stresses. Thus a vicious circle is formed, and the **traumatic occlusion** caused by the raising of the tooth in its socket aggravates the condition.

These points are very important, as they help us to form a **differential diagnosis** between a simple pulpitis and the more advanced condition of periodontitis. By differential diagnosis is meant a decision as to which of one or more diseases the condition is due. Such a decision is arrived at by considering the different signs and symptoms.

In pulpitis the pain inclines to be severe, sharp, shooting, throbbing with the pulse, and intermittent. Percussion (tapping the tooth) is probably not painful, whereas sucking the cavity may cause a severe paroxysm. Changes of temperature, such as contact with cold (*i.e.* cold air, water, ice cream) will cause sudden and severe pain, but contact with heat will not be so painful.

In periodontitis the pain may be described as heavier. It is more constant, and the throb is duller. Percussion is extremely painful, and there may be some looseness of the tooth accompanied by heat and swelling. The tooth will feel raised in its socket, cold water will tend to relieve the pain, and hot will increase it.

These points are very important when it comes to rendering first-aid for toothache.

Whereas in pulpitis the inserting of a soothing dressing into the cavity is indicated, we must beware of any treatment in a periodontitis which will plug up the cavity, as this will increase the severity of the pain and may precipitate extensive swelling and alveolar abscess.

Periodontitis may occur in a sound tooth as the result of any trauma, such as a blow. Except in severe cases, periodontitis from such a cause will usually subside and leave no ill effect, but severe trauma may result in the death of the pulp. This may remain undetected for years, and may cause an acute abscess long after the original injury. However, the condition reveals itself to the expert by the change in colour of the tooth, which must be opened up and the dead pulp removed if the tooth is to be saved. A **dental cyst** may arise from this cause.

Periodontitis from a septic pulp often proceeds a stage further, resulting in an **alveolar abscess.** Such an abscess gives rise to much pain, to heat, and usually to swelling of the surrounding tissues, which may be considerable. Pus is formed which, if left alone, usually breaks through the outer bony plate of the jaw into the cavity of the mouth, or less frequently on to the surface of the face. This condition should not be regarded lightly, as not only may the patient suffer from a severe general **malaise** (feeling of being ill), but toxins may enter the blood-stream and cause permanent injury to other parts of the body. Disfigurement may result from a break through to the cheek. The abscess should be encouraged to discharge into the mouth ; much damage may be done by ill-advised foments applied to cheek and neck.

An alveolar abscess may lead to **necrosis** (death) of the jaw-bone itself, with resulting loss and deformity. If the inflammation spreads to the marrow of the bone the condition, which is very destructive and frequently fatal, is known as **osteomyelitis.** Extraction at the earliest possible moment is usually indicated, but where this is impracticable nature may be aided by judicious incision to liberate the pent-up pus.

When an acute alveolar abscess has burst unaided a spontaneous or natural but partial cure comes about, through nature effecting drainage, by forming a channel or **sinus** from the tooth to the outer surface of the jaw, through which septic matter can be discharged. This condition, which is known as a **chronic abscess,** may continue for years and is a very undesirable state of affairs. The abscess usually flares up periodically into an acute or sub-acute condition, and is probably responsible for a certain degree of **toxaemia** (toxins or poisons in the blood-stream). These toxins may effect other organs of the body, such as the joints, the heart or the gall duct, causing respectively **arthritis** of the joints, **endocarditis** or **myocarditis** (inflammation of the heart muscle), or the formation of **gall stones,** from inflammation of the gall duct—resulting in a general loss of vitality.

Thus we see the far-reaching effects of what at first might be regarded as an apparently unimportant trifle—namely, the lodgement of soft sticky food on the teeth. This, however, provides nutriment and favourable breeding conditions for acid-forming bacteria. The acid destroys the tooth enamel : Bacteria invade and devour the dentine : the pulp is infected and dies : an abscess is formed : poisons enter the blood-stream, leading to a lowering of the general health, and causing perhaps chronic rheumatism, arthritis, gall stones, heart disease, or even death.

B. DISEASES OF THE TISSUES SURROUNDING THE TOOTH

(Paradontal Diseases—Gingivitis, Chronic General Periodontitis, Pyorrhoea, and Acute Ulcerative Gingivitis or Vincent's Disease)

Consideration of the general or systemic diseases which may be wholly or partially attributable to dental disease, brings us also to that group which is classified under the general term paradontal disease, often loosely called pyorrhoea. To this group, more than to the actual disease of individual teeth, are attributed the many serious systemic conditions which are associated with dental disease.

It has been explained that the term paradontal is used in connection with all those tissues which surround the teeth, including the bony socket, while periodontal refers only to the membrane itself surrounding the tooth.

Paradontal disease is a condition which results in the slow progressive destruction of the gingivae of the gums, the periodontal membranes of the teeth, their bony sockets, and the alveolar process, leading to the loosening and subsequent loss of the teeth themselves. The term paradontal disease includes the diseases **gingivitis, chronic general periodontitis** and **pyorrhoea,** which are really progressive manifestations of the one and same chronic disease.

The infection, which may be acute in its early stages but soon becomes chronic, starts at the gingivae, or gum margin at the site of its attachment to the tooth, and at this stage is known as a **gingivitis.** When the inflammation becomes chronic and reaches the periodontal membrane, the condition is known as **chronic general periodontitis.** Inflammation leading to destruction of the gingivae causes a pocket to be formed in this area, which favours the growth of bacteria and through their action gradually deepens, until the entire periodontal membrane and also the bone forming the socket are destroyed. The tooth becomes progressively looser, and if not removed, ultimately falls out. The bacterial toxins formed in these pockets are absorbed into the general system by the lymphatics, and may cause serious trouble in other parts of the body. As the real infiltration of the enemy is always in advance of the pocket, the difficulty in fighting this disease consists in obtaining adequate drainage, and in getting our drugs to the " front line."

Although it can be demonstrated microscopically, pus is not always evident to the naked eye. Food debris and dead tissue are often mistaken for pus. Strictly speaking, if the presence of pus is not evident to the naked eye, such a condition cannot be called pyorrhoea, although it is often labelled erroneously in this way.

Pyorrhoea means " flow of pus," and when this is evident the condition is a true pyorrhoea. Whitish or pale yellow pus can be seen continually exuding from the pockets round the necks of the teeth. This type very often attacks young subjects in their teens or twenties, who frequently have exceptionally fine and beautiful teeth.

An acute manifestation of paradontal disease can be developed, but it is caused by an entirely different infective agent. This disease is known as **acute ulcerative gingivitis,** or **Vincent's disease,** and is caused by an acute

fuso-spirillary infection. The name **trench mouth** was given to it in the 1914-18 War because it came into prominence in the trenches, but this term is now seldom used.

The infection is called fuso-spirillary because the fusiform (flask-shaped) bacillus and the spirochaete of Vincent are the infective organisms; they are present in great numbers. The organisms acting in "symbiosis" (which means literally, "having a life together") are generally considered to be the cause of this disease, but this is disputed by some authorities. We know, however, that the more severe the condition the larger are the number of these organisms present. The disease is of fairly sudden onset, and is characterized by pain, readily bleeding gums, and foetid breath. There is a marked line of ulceration at the gum margin, where destruction of the gingivae and the interdental papilla (the small triangle of gum between the teeth) has taken place, and a very characteristic foetor (bad smell) is evident. This disease can almost be diagnosed by the smell alone. Fortunately the disease yields readily to vigorous treatment, and the acute condition should clear up rapidly. However, enough destruction may be left behind to pave the way for a chronic paradontal condition.

Acute ulcerative gingivitis is contagious, and care must be taken if epidemics are to be avoided. Sterilization must be very thorough, and patients should have separate eating utensils and mess-traps while the disease is in the acute stage, and they should be warned against kissing. The habit of passing a cigarette round from mouth to mouth must be discouraged. A separate mess, with sterilization under supervision, may be advisable.

Paradontal diseases, involving as they do all the paradontal tissues, lead to the loss in greater or lesser degree of the alveolar bone, causing a destruction of the tooth sockets, and the loosening and eventual loss of the teeth.

Other inflammatory conditions may occur which affect principally the mucous membrane of the mouth. As mentioned above, an acute inflammation confined to the gingivae or gum-margin around the necks of the teeth is known as a **gingivitis,** but it may be due to organisms other than Vincent's, and may not be the prelude to paradontal disease. If all, or a large part of the mouth, is inflamed the condition is called a **stomatitis** (from the Latin "Stoma"—a mouth). If the tongue is affected, it is known as a **glossitis** (from the Latin "Glossa"—a tongue).

These latter conditions may be classified as infective, chemical, or traumatic, according to the cause. For example, an infection by the **micrococcus catarrhalis** will produce a **catarrhal gingivitis** or **stomatitis.** The taking of bismuth or mercury for some general disorder may result in the well-known bismuth or mercurial forms of stomatitis, and any injury, including the too vigorous use of an over-hard toothbrush, will produce the traumatic forms.

What in the first instance may be a simple gingivitis may, if left untreated, progress to an established paradontitis or pyorrhoea. Patients who are habitual mouth breathers are prone to a persistent gingivitis, and the gum margins in the incisor region become swollen, and present a typical "heaped up" appearance.

OTHER DISEASES AND ABNORMALITIES OF THE TEETH AND JAWS

A brief reference is made to some of the other conditions which may be encountered in the mouth.

Odontomes are defined as "abnormalities of excessive growth derived from the dental formative organs." They fall into two main classes. The first includes **dental cysts, dentigerous cysts** (cysts containing a tooth), and **multilocular cysts** (cysts having many compartments), all of which spring from the epithelial part of the dental formative organ. The second class consists of **composite odontomes** of great variety, which sometimes attain considerable size, and consist of irregular masses of enamel, dentine and cementum, which spring from the epithelial and mesoblastic, or middle, layers of the dental formative organ.

Various abnormal growths or tumours not classified as odontomes are also met with in the mouth. Such a list includes the **papilloma** or wart, the **epulis,** which is inflammatory in origin and usually springs from the gum between the teeth, the **fibroma,** consisting of dense fibrous tissue, and the **osteoma,** a tumour of bone. These are known as **benign** or **innocent** tumours, in contra-distinction to the **malignant** or **cancerous** growths which may show manifestations in the mouth and include such tumours as **myeloma, sarcoma, carcinoma,** and **epithelioma.**

Various abnormal appearances of the tongue and mucous membrane of the mouth may be encountered, which may be diagnostic of **syphilis, anaemia,** or other general disease.

Necrosis of the jaw—death of all or part of the bone—may occur from the following causes :—

(*a*) as the result of bacterial poisons following severe infections ;

(*b*) from chemical poisons such as arsenic, mercury, or phosphorus fumes ;

(*c*) from mechanical injury.

Such a condition may be very serious and call for expert treatment.

Where the marrow of the bone is involved, the condition is known as **Osteo-myelitis,** and is an extremely grave condition.

The subject of **fractures** of the jaws following injury is a vast one, and great strides have been made since the days when a four-tail bandage was the routine treatment. Astonishing results have been achieved in what might have appeared hopeless cases, by the dental surgeon working in conjunction with the plastic surgeon.

It is no part of the dental surgery attendant's duties to make a diagnosis, but he should make himself sufficiently familiar with the normal appearances of the mouth and jaws to be able readily to notice any abnormality. This he should report to the dental officer, who in turn will bring the case to the notice of the medical officer, if the condition calls for medical attention.

CHAPTER 4

PROPHYLAXIS

BY **prophylaxis** is meant the measures taken for the prevention of disease. Healthy teeth and jaws are possible only if the body itself, of which they form a part, is healthy too, with its "services"—defence and supply—in good working order. In addition, the teeth must be well developed and well arranged. They must be given work to do, and must be kept clean.

In a *truly* healthy body, most of the other requisites for the prevention of dental disease follow. The teeth will be well formed and strong. In this connection the proper nutrition, not only of the individual but of the mother of the unborn child, is essential.

Correct alignment of the teeth and freedom from overcrowding will depend upon well developed jaws, which will follow correct nutrition and the avoidance of bad habits such as mouth breathing and sucking a "comforter" or the thumb. Mouth breathing is often a result of adenoids, which may need removal. The development of the jaws will be adversely affected from lack of proper use, such as the habit of bolting food, and of avoiding hard articles of diet. Poor development leads not only to deficient structure of the teeth, and the surrounding bone and the gums, but to crowded teeth, which conditions predispose to caries and paradontal disease.

Civilized man requires artificial aid in keeping his teeth clean. He eats many soft substances, and too few hard cleansing items of diet. Many children are given a biscuit to eat after being put to bed, to "keep them quiet." As a result, they fall asleep with a sticky mess of food clinging to their teeth, and the seeds of dental destruction are sown. It is not considered polite to suck or pick the teeth after eating. Many natural habits of cleanliness therefore become suppressed, and the careful use of the toothbrush must take their place. This attention to oral hygiene, combined with a regular dental inspection, forms the basis of prophylaxis. Absolute cleanliness is virtually impossible, so that in almost every case caries will start. If this is detected in its early stages the affected tooth can be conserved, probably for a life-time, by a small filling. Early detection of paradontal disease too is of the utmost importance in checking a condition which, if left too long, may require radical treatment involving the loss of all the teeth. Even this drastic treatment may be too late to prevent serious resultant conditions in other parts of the body.

It cannot be expected that the mass of people will take a serious interest in oral hygiene while they are unaware of the tremendous importance of sound teeth and healthy gums, and are ignorant of the far-reaching and even fatal consequences of neglect. The idea of allowing the teeth to get into a thoroughly deplorable condition before seeking attention, and then undergoing wholesale extractions to make a "clean sweep," because of the notion that doing a thing by halves is to be avoided, is really tragic. Many people express the view that they "do not believe in fillings" and prefer to "wait till the tooth hurts and then have it out." Of course it may never hurt, but become a focus of infection, which alas may cost the victim dear.

It is our duty to impress on everyone the importance of a healthy mouth, and to pass on to them our knowledge of the serious consequences of neglect. We must instruct them how to brush their teeth, so that *all* the surfaces of *all* the teeth are cleaned efficiently, and they must be told to do this at least morning and evening, preferably after breakfast and the last thing at night. The operation should be as carefully performed as shaving. Many persons think they are cleaning their teeth because they use a brush twice a day. It is probable that a habit is formed which leaves untouched the same areas every time—for example the back of the lower incisors. The gums must be brushed also, but not injured by hard scouring. Periodical inspection and treatment will ensure that, not only are fillings inserted at the earliest sign of decay but that all foreign deposits on the teeth are removed.

The saliva deposits various lime salts on the teeth, and this deposit is known as **salivary calculus** or tartar. Usually it is found opposite the ducts of the salivary glands—namely on the backs of the lower incisor teeth, and the buccal surfaces of the upper molars.

The deposit of calculus is very insidious, and creeps downward under the gums. It has a very damaging effect on the paradontal tissues, and its careful removal is of the utmost importance in the prevention and treatment of all forms of paradontal disease. The operation for its removal is called **scaling.**

The micro-organism **lepthothrix buccalis** plays an active part in the formation of calculus according to some authorities, and it is claimed that without this organism deposits could not occur. This is of interest, but of little practical importance, since we are unable at present to exclude the lepthothrix organisms. The deposit is much favoured by lack of function. Occasionally a mouth is seen in which the teeth on one side only are heavily coated. There is always a history of a tender tooth on that side. The patient, having completely given up chewing on that side, even after the removal of the offending member, persists in the habit.

The importance of dental prophylaxis must be impressed individually and collectively on everyone. They must be taught the value of a sound dentition. Something of the possible dire consequences of neglect must be taught also, and the value of correct diet and good habits. Above all, the importance of periodical dental inspection and early minor treatment must be emphasized.

The dental surgery attendant can play a very important part in this education, and by his ability, teaching and sympathy do his part to make periodical inspection something which the patient will regard, not with boredom and dread but with an intelligent co-operative interest.

Part II.

PROFESSIONAL DUTIES OF A DENTAL SURGERY ATTENDANT

CHAPTER 5

GENERAL DUTIES

THE MAINTENANCE OF CLEANLINESS IN THE DENTAL SURGERY

IT should not be forgotten that Dental Surgery is a special branch of General Surgery and should therefore take place in surroundings comparable with an operating theatre, the clean, quiet, quick efficiency of which should be aimed at.

The dental surgery attendant should strive for a spotless dental surgery, with glittering equipment, clean walls and paintwork, and polished floors and windows. Clad in a really fresh gown, with well scrubbed hands and clean finger-nails, he should go about his duties quietly and efficiently. No less than the dental surgeon, he must aim at a high personal standard of bodily and oral hygiene, avoiding such articles of food and drink as might give offence.

The dental surgery should not be cluttered up with non-essentials and personal belongings. Photographs of relations or picture postcards are not appropriate. One drawer or cupboard may be set aside for the use of the dental surgery attendant, but it must be kept clean and tidy. The mental effect of his surroundings on the patient, who is probably slightly apprehensive and therefore unusually observant and hypercritical, must not be forgotten. If the dental surgery has a frowsy, dirty, neglected appearance, how can one hope to gain the confidence of those presenting themselves for treatment?

Men are, as a rule, not very perceptive as regards household cleanliness. This is left to their womenfolk and is apt to be taken for granted. The dental surgery attendant must develop an acute "house proud" sense. Dust, dirt, unpolished floors and furniture, dirty paint-work and glass, dull plating and tarnished brass, will be as distasteful to him as soiled shoes and linen, and dirty face and hands, are on his own person.

The dental surgery should be thoroughly turned out weekly, and all "bright-work" and furniture polished in addition to the daily rubbing up. Paint work should be washed, windows cleaned and floors scrubbed or polished. All parts of the department, including stairs, waiting, store, and other rooms, should be kept up to the same standard. It is usually possible to obtain assistance from a working party.

Breakages and damage must always be reported promptly. Chipped, broken, or crudely patched equipment should not be used as makeshift. Such a state of affairs is cumulative, and leads gradually to the whole department assuming a very low level of appearance and efficiency.

Advantage should be taken of any opportunity of having dirty walls washed down, paintwork touched up, or any redecoration done that is needful.

PREPARING THE PATIENT

The dental surgery attendant will see to it that, as treatment for one case draws to a close the next patient is standing by. Perhaps ten or more patients have to be dealt with at one session, and a minute wasted between each amounts to an appreciable loss of precious time. If, by any chance, no following patient is available the operator should be informed in good time, so that he may plan a longer sitting for the case in hand.

Each case should be ushered in quietly, cheerfully and politely. The patient is in our care, not a refractory character to be bullied and intimidated. It should be remembered that the patient's first impressions will influence his attitude to treatment. If these are unpleasant, the operator's difficulties will be increased.

The atmosphere of the dental surgery should be tranquil. The dental surgery attendant should not rush about, clatter instruments, or speak loudly. He should move quickly but quietly ; rubber soled shoes are desirable. He should endeavour to inspire confidence, remembering that the patient, who should be treated kindly, may be somewhat apprehensive.

The patient's particulars will have already been entered on Form M.228. The dental surgery attendant must plan his work so that the operator's time is interfered with as little as possible. He will, therefore, choose some quiet moment in advance for entering up fresh cases, etc. This principle will guide him throughout the day, so that a smooth routine is established.

Each operator is, of course, entitled to have things done in the way he likes best, so that no hard and fast routine can be laid down. The following routine procedures, however, should call for little variation.

All relative forms, X-ray photographs, denture work, correspondence, etc., must be in readiness beforehand. The patient having been seated in the chair, his hair should be covered with a clean white cap or triangular bandage (this protects the operator's white coat) and a clean towel or bib placed round his neck. The back and head rest of the chair should be adjusted so that he is comfortable, with his head neither thrown back nor sunk on his chest. In this connection the dental surgery attendant should make himself familiar with all the movements of the dental chair, and should know how to regulate the valve controlling the speed at which it sinks. Chairs should never be allowed to descend with a crash. The tumbler and saliva tube used by the previous patient should be removed in the presence of the patient, thus giving him confidence that everything is fresh, and a fresh sterilized tumbler and saliva tube brought, the former containing some mild comfortably warm mouth-wash.

The bracket table should be wiped with a mild solution of antiseptic or with surgical spirit, great care being taken to see that it is free from blood stains. The waste receiver must be cleaned between each patient, and should be emptied at least daily. The dental surgery attendant should see that the cotton wool holder is not empty, and that the bunsen or spirit-lamp is lit,

and should set out a sterile mouth mirror, probe and conveying forceps, and see that the chip and water syringes are clean and in place. He should see that the saliva ejector is working, and that the atomiser functions, its bottles being charged and the air pressure in the cylinder sufficient.

The instructions above having been carried out, operating can commence.

CHAIR-SIDE ASSISTANCE

The amount of assistance required varies greatly with different operators. One will demand little more than the mixing of amalgam, preferring that the dental surgery attendant devote his time to cleaning up, sterilization and clerical duties. Another will expect the dental surgery attendant to hand every instrument used, to retract the cheek, to use the chip syringe, water syringe and atomizer, to swab blood, and to manipulate the saliva ejector, and in addition to fill the dental syringe and amalgam carrier and prepare all filling materials.

In any case, the dental surgery attendant must learn to anticipate the requirements of the dental officer. He should take an intelligent interest in the operation, and have in readiness all instruments and appliances likely to be required. For example, if a " synthetic " filling is in progress, he will have ready the correct non-staining plastic instruments, be prepared to mix the synthetic cement and the lining cement, and have ready celluloid strips, vaseline and varnish. A section on the preparation of filling materials is given on page 38.

CHAPTER 6

DENTAL EQUIPMENT AND INSTRUMENTS

THE dental surgery attendant must have a sound knowledge, which can best be acquired by actual experience in the dental surgery, of all dental equipment, instruments, appliances, materials, drugs and medicaments in common use, an illustrated list of which is given in the Appendix together with a brief description of the uses of each item (see page 88).

The method of demanding and accounting for stores is given under Part III, " Clerical Duties of a Dental Surgery Attendant," pages 64 to 73.

EXTRACTING FORCEPS AND ELEVATORS

Upper molar teeth are extracted with " full " upper forceps, either left or right, known for short as **" upper fulls."** The outer blade of these is provided with a spike, which fits between the two buccal (cheek) roots. Left " upper fulls " will therefore have the spike on the operator's right as he holds them, and *vice-versa*.

Posterior upper teeth, and roots, are also removed with **" bayonets."** These forceps are so called because the blades are parallel to, but not in a straight line with the handles, being posterior to them, like a bayonet on the barrel of a rifle.

Upper pre-molars and roots are usually removed with root forceps. These have slightly curved, comparatively slender blades, and may be heavy, medium or fine. They are usually known as **" Read's,"** but this term refers properly to the type of handle, which may be found on any pattern of upper forceps. This handle is specially curved to prevent the hand slipping, and is named after its original designer.

Upper canines and incisors and their roots are extracted with **" straights."** These forceps have straight blades in line with the handles. They may be heavy, medium or fine.

Lower teeth are removed either with **" full lowers,"** or **" lower roots."** These forceps are also known as **" Hawk's Bills,"** because they resemble the beak and mandible of a bird. The tips of the blades are at right-angles to the handles, and not in line as in uppers. The " full lowers " have a spike on both blades, which fit lingually and buccally between the anterior and posterior roots of the molar teeth. Posterior lower molars may also be removed with **" Cow Horns,"** which are like upper forceps but have the blades bent sharply downwards to form nearly a right-angle with the handles.

Curved elevators are used for removing buried roots, etc. They have large handles, with a short blade set at an angle to the shaft, and are designed in pairs for use on the right and left side. They cannot properly be described individually as left or right, as their use depends on whether the operator is standing in front of or behind the patient. Unless he is left-handed or ambi-dextrous, he usually stands behind the patient when removing lower right teeth.

The **straight elevator** has a similar handle, terminating in a straight blade. It is used to loosen a tooth in its socket by a slight rotary movement of the blade, prior to its removal with forceps.

There are many special types of elevators for dealing with buried and impacted teeth, and in this connection bone cutting chisels and gouges also.

An automatic type of bone cutting chisel has also been designed for attachment to the dental engine.

EXCAVATORS

Excavators are used for removing caries (decayed dentine) from a tooth cavity. The usual type is the spoon excavator, so called because the end is like a small round spoon. These spoon-like ends are of different sizes, and are set at different angles to the shaft.

Spoon excavators are usually double-ended, having a spoon of the same size and angle at either end, but set the opposite way, one left and the other right. The single-ended type is also in use. In common with all instruments, it is important to remember to specify which pattern is required when demanding stores. Another form of excavator less commonly used is the hatchet, which has a small blade instead of a spoon. (Now study Appendix B, page 94.)

THE CARE AND MAINTENANCE OF INSTRUMENTS AND APPLIANCES

Constant sterilization, though very necessary, is not good for instruments which, unless thoroughly cleaned and polished daily and kept sharp, will soon deteriorate. Polishing is best done with chamois leather and plate-powder, as for household silver. Instruments may be much improved by soaking them for fifteen minutes in hot Lysol (a tablespoon to half-a-gallon), subsequently washing them in hot water and rubbing them up. A pinch of washing soda in the sterilizer will help to protect the plating.

Instruments are sharpened on an Arkansas Stone, on which is placed a drop of oil. Such sharpening is essential for **scalpels, lancets, chisels and gouges. Spoon excavators** may be sharpened on a special grooved carborundum stone. **Steel knives** if put away with finger prints on them will, even if oiled, later show corrosion. Finger-prints should be carefully wiped off before instruments are put away.

Sharpening is a skilled procedure, and the novice should seek instruction from the expert, lest he blunt rather than sharpen.

The dental surgery attendant should not clatter instruments nor throw them about. This is bad for them, besides disturbing the patient and irritating the operator.

Neither **amalgam carriers** nor **engine handpieces** should be boiled (as regards the latter, it is as bad as boiling a watch). Instruments with fine cutting edges should not be boiled, unless instructions have been received to do so. Their sterilization is effected by immersion in spirit or pure phenol. The treatment of **dental syringes** will depend on the type used. In any case, prolonged boiling is unnecessary and undesirable. The plunger should always be taken apart before a syringe is placed in the sterilizer, especially if the

barrel is of glass. Syringes should be taken to pieces at least weekly, and the barrels cleaned with a " pull-through." A cotton wool roll or napkin is excellent for this purpose. The plunger, after sterilizing, should be lubricated with a slight smear of vaseline, which has previously been sterilized by placing it on a spatula over a flame until it smokes. During and after lubrication the plunger should not be touched with the fingers. The syringe is then reassembled, boiled for a few minutes, and placed straight from the sterilizer into a jar of Dr. Smith's Solution (see page 36).

Amalgam carriers should be taken apart weekly, thoroughly cleaned, and a very slight smear of oil placed on the plunger. The end should not be filled up with vaseline, or the operator may ruin his next filling by conveying equal parts of vaseline and amalgam to the cavity. Care should be taken *never* to leave amalgam in the carrier, as it sets and immobilises the plunger. Oil, moisture, saliva or debris should always be removed from the plunger end which should be sterilized by passing it rapidly through the flame.

Handpieces require particular care. Far too many are returned to store as unserviceable owing to neglect. They should be kept immersed overnight in liquid paraffin, or special engine oil. Heavy crude oils should not be used. Before use, handpieces should be run every morning for a minute or two on the engine, and the excess oil, which can be mopped up on a dental napkin, allowed to work out. They should be removed from the engine immediately after use, carefully cleaned, dried and passed rapidly through the flame. The outer sheath of the straight handpiece must be removed at least weekly for cleaning and oiling. This is done by undoing the small retention screw and slipping the sheath off. It is better not to take apart the right-angle and contra-angle handpieces except in emergency, as they require a very fine adjustment, which can only be effected by an expert with a special set of implements. It should not be forgotten that the milled screw where the burs are inserted has a left-hand thread, and therefore unscrews clockwise. This may have to be undone should a bur become jammed. Burs, or other instruments, must always be removed from the handpiece after use. If left, they become rusted in. Such things as root canal drills are dangerous if left on the engine. A death has been recorded through the operator inadvertently bumping into one of these.

Burs should be very carefully cleaned with the wire bur brush—either the hand, or the rotating engine pattern—and all debris removed before they are sterilized. There are few things so displeasing to the operator as being presented with a bur which, although reputedly sterile, is clogged with foreign matter. A small amount of sterile lubricant considerably prolongs the life of burs.

Barbed broaches should have debris very carefully " teased off " by passing them through rubber dam sheet, care being taken not to injure the barbs by rubbing them the wrong way. The broaches should be kept in an antiseptic solution of the Lysol type, which will prevent rust. It is useful to have a wide necked bottle with a large cork, into which the broaches can be stuck.

The dental surgery attendant should see that he has a supply of all necessary **washers** for syringes, atomiser, fountain spittoon, etc. He should learn how the **atomiser** works and be able to deal with a leak or a choked jet. When pumping up the tank, he must first see that the valve into the tank is turned on. It should be turned off when sufficient pressure has been obtained.

He should see that he has at least one spare electric bulb for the heating of atomizer bottles, and also a spare one for the **shadowless lamp.**

He should keep an eye on all rubber articles and if they appear to be perishing, demand others. Spare tubing for the saliva ejector should always be kept in store.

He should master the mechanism of the **dental chair,** and see that the pump has sufficient oil and that the valve controlling the speed of descent is properly adjusted.

After the administration of nitrous oxide anaesthesia (gas case) all the **cylinders** of the **gas apparatus** must be turned off properly and tested for leakages. All blood and debris from the facepieces, valves, and gasbag must be removed, after which they should be wiped with a mild antiseptic. The rubber valves should be inspected to see that they are not perishing. The rubber part of the face pieces should always be removed from the celluloid, and cleaned thoroughly. Rubber parts, such as the bag, tubing, and face cushions, should be stowed in a cardboard box, after being wiped with French chalk. (See Chapter 12, " The Conduct of Gas Cases.")

The **dental engine** may require a little oil occasionally, but this should never be overdone. More harm is done by over-oiling than under-oiling. Over-oiling will affect the electrical contacts of the armature. Just enough oil should be used to permit it to run silently. Major adjustments or repairs should not be attempted, but the dental surgery attendant should learn to replace a worn brush, for which he should have spares.

Instruments and appliances in occasional use should be lubricated, stowed away, and examined from time to time.

Surgical scissors are to be reserved strictly for operations in the mouth, and are not to be used for general purposes, for which a pair of ordinary scissors should be available.

CHAPTER 7

STERILIZATION

BY sterilization is meant the complete destruction of bacteria. Instruments and appliances are therefore sterilized so that they may be free from these dangerous micro-organisms. The three methods of sterilization that concern us are :—

(1) destruction by boiling ;
(2) destruction by immersion in chemical solutions, called antiseptics or disinfectants ;
(3) destruction by passing through a flame.

In surgery two main techniques are recognized, **asepsis** and **antisepsis.**

The **aseptic** technique (the word means literally " not septic ") depends on the fact that every instrument, dressing, towel, and the operator's gloves, clothing, etc., are free from bacteria, and are not allowed to come in contact with a non-sterile object. Thus, when a non-infected part of the body is opened up during an operation, it remains free from contamination.

Antisepsis (meaning literally " against sepsis "), depends on maintaining the destruction of bacteria, by keeping instruments immersed in antiseptic chemical solutions, which are also used to irrigate the wound. The disadvantage of this method is that these solutions, although destructive to enemy bacteria, are also harmful to the living tissues and to the body's defences, and healing is delayed. The advantage of the system is that it is more easily carried out than asepsis, which requires elaborate apparatus such as the autoclave, operated by superheated steam under pressure, for sterilizing dressings and towels.

In dentistry complete asepsis is impossible. A compromise is therefore effected by boiling such instruments and appliances as can be boiled, and using antiseptics, or the actual flame, for those which cannot.

STERILIZATION BY BOILING

The sterilizer is usually electric and, unless of the old-fashioned pattern, will have an automatic cut-out. This consists of a plug of fusible metal, which will melt in the event of the sterilizer boiling dry, and cut off the current. The sterilizer, however, should not be allowed to boil dry. If there is no safety device, much harm will be done. There is usually a switch with three positions, slow, medium, and fast. When patients are being seen, the sterilizer should always be kept on the boil. The operator cannot afford to wait even five minutes for it to boil up. The dental surgery attendant should therefore make a habit of " topping it up " a little at a time with water, and not wait till it is nearly dry, and then fill it full of cold water. He should never throw instruments in, but convey them gently with Cheatle's Forceps. These forceps have bird-like beaks, and are designed to pick up easily even flat thin articles. A cooling tray, containing sterile water or a mild antiseptic, should be alongside. The sterilized instruments are picked out of the sterilizer with the Cheatle's Forceps, and placed direct into the tray. When the instruments are cool, they

are picked out in a similar manner—*not* with the fingers—and handed straight to the operator, or alternatively wiped with a sterile towel, or placed on one. If a sterile towel is not available, the handles only of the instruments should be wiped. On no account should the operating part of the instruments be touched with anything that is not sterile, otherwise they will become contaminated.

The beaks of the Cheatle's Forceps must be kept either in the cooling tray or in a special jar of antiseptic or sterile fluid, for if laid down anywhere they cease to be sterile, and will then contaminate the instruments. A mild saline solution is sufficient in the tray. Antiseptics of the Lysol type (liquor cresol saponatus) are to be avoided, as they are slimy and slippery in strong solutions, and even a trace of a weak solution in a dental syringe may decompose the anaesthetic solution.

The novice is apt to consider that a wet instrument is a dirty one, and that it must be wiped, even on a cloth of doubtful cleanliness, before it is fit for use. He must learn to distinguish between physical and surgical cleanliness, and to bear in mind that the moment a sterile object comes in contact with a non-sterile one, it becomes contaminated. He must see to it that the "aseptic chain" is not broken. On the other hand, physical cleanliness is the first step towards sterility. Everything must be thoroughly washed and scrubbed before sterilization. Especially must blood-clot be removed.

The sterilizer should be filled rather less than half full with water, and a pinch of washing soda added to prevent rust.

It should be emptied and wiped out every day, and should have all scale removed weekly. If this is not done not only is the boiling time increased, but the hinges of the lid become affected, and it will not close properly.

DISINFECTANTS

Fine edged lancets, scalpels, chisels, gouges, etc., which are adversely affected by heat, are sterilized by immersion in chemical solutions, such as **carbolic acid, alcohol, formaldehyde,** and such proprietory preparations as **Dettol, Dettolin, T.C.P., and Lysol.**

Solutions of these disinfectants are also used in the mouth, and care must be taken that they are used in the correct strength for each purpose.

A very good preparation in which to keep dental syringes, and in which they should be totally immersed, is known as **Dr. Smith's solution,** and is made as follows :—

	Percentage by weight
Phenol (carbolic acid)	2.66
Sodium biborate (Borax)	.33
Glycerine	16.00
Peppermint water	2.00
Distilled water...	100.00

Carbolic acid can be used pure for sterilizing lancets, scalpels, etc., but the acid must be washed off by a weak solution before the instruments are used. Pure carbolic acid is very destructive to the tissues, and must not be allowed to come in contact with skin or mucous membrane. If used in this

concentration for sterilizing instruments, only the operating part of the instrument should be immersed in a very small quantity, contained in a suitable gallipot or bottle. Carbolic acid is used in solutions of 2.5 to 5 per cent (one part in forty, to one in twenty) for treating wounds and ulcers, and in weaker solutions for disinfecting instruments. For a mouthwash, solutions not stronger than 1 per cent (one part in one hundred) are used.

Alcohol 70 per cent (surgical spirit) is used for sterilizing scalpels, surgical needles, and other instruments.

Formaldehyde is used as a 40 per cent aqueous solution, known as **liquor formaldehyde** or **formalin.** This solution is a powerful irritant, and must not be used in the mouth stronger than one part in a hundred.

With regard to proprietary preparations, the manufacturers' instructions are to be followed carefully.

THE FLAME

The naked flame is a most effective sterilizer, but it must be used with great discretion, as the heat alters the temper of steel instruments. Such articles as cannot be placed in solutions without detriment, *i.e.* amalgam carriers, handpieces, etc., may be passed rapidly through the flame of a gas bunsen or spirit lamp. The syringe needle also may be treated thus, and indeed any instrument, but these procedures are best left to the operator.

Bunsens and spirit lamps should be kept in good working order, they should be clean and free from wax or other deposits, and burn with a clear and smokeless flame.

CHAPTER 8

THE PREPARATION OF FILLING MATERIALS

THE dental surgery attendant will be called upon to prepare the following materials.

TEMPORARY FILLINGS

Gutta Percha. This is supplied in the form of sticks. When required for use, a portion is held over a bunsen or spirit flame until it is sufficiently plastic to be inserted into the cavity. Over-heating renders it powdery and useless. It must not come into direct contact with the flame. It is used as a temporary filling for the retention of dressings, and is usually supplied in two colours, white and pink, the latter being employed when arsenic dressings are used for devitalizing the pulp. The pink colour serves as a warning and reminder to the operator that a dressing, which may prove harmful if left too long, lies underneath.

Zinc Oxide and Oil of Cloves. This very useful dressing has of late years largely superseded gutta-percha. It is soothing to the tissues, and being of an oily nature is impervious to moisture. Sufficient zinc oxide (a white powder) is placed in a small heap on a glass mixing slab, beside a small quantity of liquid oil of cloves. By means of a metal or bone spatula, as much powder is incorporated with the liquid as it will take up, forming a stiff putty-like mass. The result must be as firm and thick as possible. Too much oil must be avoided. It is surprising how much powder can be absorbed, even after the mass appears crumbly. A sloppy mix must be avoided, as it washes out of the cavity of the tooth before having time to set.

Carbolized Resin. A very temporary combined filling and dressing is obtained by saturating a pledget of cotton-wool in carbolized resin, inserting it in the cavity, and giving the patient a mouthful of cold water to hold round the tooth for a few moments until the mass sets. Carbolized resin is a very sticky substance, and the greatest care must be taken to see that all traces are removed from instruments with spirit or alcohol, before they are used again. Ordinary wiping and boiling will not be found sufficient.

PERMANENT FILLINGS

Amalgam is formed by the amalgamation of a metal alloy with mercury. The alloy most frequently used consists mainly of silver and tin, the former predominating, with small quantities of other metals, such as gold, copper and zinc. Copper amalgam, which has special uses, is a less permanent preparation, consisting of copper only and mercury.

Silver-tin alloy is supplied in the form of filings. The setting time depends largely on the size of these particles. Thus slow-setting and quick-setting amalgams have different sized particles. The bottle containing the alloy should be shaken up and mixed occasionally, otherwise the finer filings will sink to the bottom, and the residue will become increasingly quick-setting. Perhaps the most satisfactory way of measuring the relative quantities of alloy and

mercury required is to use a balance designed for the purpose, but failing this, the mixer learns to judge the amounts with sufficient accuracy for practical purposes. The filings are tipped into a glass mortar, and mercury is then added drop by drop from a mercury dropper. There are various kinds of droppers in use. Some are designed to deliver any size of drop desired. The alloy and mercury, when rubbed together with a glass pestle in a mortar, coalesce or amalgamate. After amalgamation, the rubbing should be continued for a full minute. Some prefer to knead the mass in the palm of the hand in the latter stages. The dental surgery attendant will be guided by the wishes of the operator. Some operators like a fairly moist mix for the initial layers of the filling, to be followed by amalgam from which every possible vestige of mercury is expelled, by squeezing the mix in a dental napkin or piece of chamois leather, with pliers if necessary. One should never start with too little mercury, otherwise a useless mass will result. Overflooding is equally bad, as too great an excess must be squeezed out, and valuable constituents may be washed away.

Copper amalgam makes a less permanent filling, but has been advocated in cases where the total removal of caries is impracticable, as it was considered to have disinfecting properties which arrested decay. It is supplied already amalgamated in the form of small ingots. These are placed in a special spoon called an amalgam spoon, and heated over a flame until beads of mercury appear on the surface of the ingots, when they are ready for grinding in the mortar with the pestle in the ordinary way.

Translucent cements are silicate cements, and are known as synthetic procelain, or " synthetic " for short. Made in various shades, by the skilful combination of which life-like restorations can be made, they are very valuable for filling front teeth. The disadvantage of " synthetic " is that it has less permanency than a metal filling, but its permanency very much depends on correct mixing.

Absolute cleanliness in mixing is essential. A special slab and spatula should be reserved for this purpose alone. The spatula and all instruments used in handling the material should be of stainless steel or bone, as ordinary metal discolours the cement.

A thick glass slab should be used for mixing, and it must be neither warm nor cold, but about 65 to 70 degrees Fahrenheit. It must be thoroughly clean and dry. The makers' instructions should be carried out faithfully. These vary with different brands.

In mixing silicate cements it is of the utmost importance to *spatulate as little as possible*. As compared with other cements, it will be found that more powder is required than expected. A goodly mound is placed on the slab, beside a small pool of the liquid. Half the mound is moved into the liquid, and the two are allowed to unite by themselves. Spatulating should be done sparingly and without pressure. The remaining powder is then added, a little at a time, and spatulated until the requisite tackiness, as shewn by the maker's instructions, is obtained. Tackiness is usually estimated by lifting the spatula from the mound, and seeing how soon the mass breaks away. If slabs, spatulas, and instruments are placed in cold water immediately after use, their cleansing will be greatly facilitated.

OXYPHOSPHATE CEMENTS

There are many brands of **oxyphosphate cement,** also referred to as "osteo" cements, but generally speaking they consist of a liquid, orthophosphoric acid, and a powder, zinc oxide with other ingredients. These cements are used for lining cavities, in order to prevent the conduction of heat or cold to the pulp, and are used for fixing crowns, inlays, fillings, etc., in place. They may also be used as a temporary or semi-permanent filling. In the latter capacity, they are less permanent and less sightly than the synthetic cements. In mixing, the consistency aimed at will depend upon the purpose for which it is required, and the operator will indicate his wishes in this respect. The mixer will soon learn to assess the relative quantities of liquid and powder. These should be spatulated quickly and boldly. Niggling is to be avoided.

Copper oxyphosphate cement is black in colour. It is therefore unsuitable for restorations except in back teeth. However, it has great tenacity and adhesion, and is therefore used principally for fixing metal capped splints. As it has some power of setting where moisture cannot be excluded, it also has value in certain difficult cases of restoration. It must be mixed thinner than other cements. Its setting time can be greatly accelerated by heat, such as a blast of warm air from the chip syringe. A warm slab is to be avoided when mixing.

CHAPTER 9

IMPRESSION MATERIALS

IN order to obtain a plaster model for the construction of an artificial denture, an accurate impression of the jaws must first be made. Many materials are used for this purpose, but the most common are :—

Composition—various makes,

Plaster of Paris,

Zelex,

Dentocoll.

COMPOSITION

As its name implies this material is a mixture of various substances. The basis is **Stearin**—the principal ingredient of animal fat. It is hard when cold, and soft and pliable when hot. Various proprietary brands are in use.

The composition is prepared for use by placing it in a basin, and pouring very hot, but *not boiling*, water over it. Quite a large amount of water should be used. Small quantities soon cool, even if very hot, as there is not a sufficient *quantity* of heat. It is a useful practice to place a dental napkin on the bottom of the basin, to prevent sticking and to facilitate subsequent cleaning. The sterilizer should never be used for the heating of composition. This practice not only fouls the sterilizer, but causes overheating of the material, with consequent loss of its working properties. After a few minutes in the basin, it will be found that the composition can be worked with the fingers into a smooth soft mass.

In this state it is placed in a suitably sized warm impression tray. The tray should not be overfilled, otherwise, when the impression is taken, a portion of the excess composition will tend to be forced backwards, irritating the soft palate, and causing discomfort and retching. Most dental surgeons will prefer to fill the trays themselves, as they will know, from an examination of the mouth, the amount of composition required.

Before the impression is taken, the surface of the composition is lightly smeared with vaseline, and is given a smooth and polished surface by passing it through the flame of a bunsen burner or spirit lamp, which must be within easy reach of the dental surgeon. The dental surgery attendant should make sure beforehand that the lamp is all right, and that the vaseline is placed in an accessible position.

Although a useful material, Composition does not accurately register undercuts, and even in skilled hands some degree of distortion is unavoidable, owing to dragging.

PLASTER OF PARIS

This material is a **calcium sulphate,** and is prepared from **gypsum.** It readily absorbs moisture from the air, causing deterioration, and must therefore be kept in air-tight tins.

Properly mixed and used, plaster of paris undoubtedly gives the most consistently accurate results of all available impression materials. When used to take impressions where some natural teeth are standing (partial cases), the plaster usually has to be broken out of the mouth, and the numerous pieces fitted together, before a model can be cast. For this reason unduly bent or battered trays, especially those with the sides bent in to form undercuts, must never be used. To mix plaster of paris for an impression, half to three-quarters of an inch of cold water is placed in a rubber plaster bowl. A small quantity of salt, or powdered alum, may be dissolved in the water to accelerate the setting time, which also varies with the temperature of the water—the warmer the water the quicker the setting. The plaster should be sprinkled slowly into the water, until there is a dry level surface of plaster showing, with little or no water visible. After small cracks appear on the surface, it should be mixed thoroughly. The mass should not be " whipped " during mixing, as this merely introduces undesirable air-bubbles, and no portions of unsaturated plaster must be allowed to remain in the mix. When dealt with in this manner, and placed in a suitable impression tray, the plaster mix will be in a suitable condition, and ready for taking the impression. When it is setting in the mouth, the state of hardness of the plaster can be ascertained by testing the residue in the plaster bowl. If it can be broken but not crushed with the fingers, the impression is in a fit state of solidity to be removed from the mouth.

When the impression has to be separated from the cast model at a later stage, it is most helpful if the plaster used for the impression has been tinted. This can be done most satisfactorily by adding a minute quantity of sodium alizarin sulphonate to the water, before adding the plaster for the impression mix. Failing this, a few drops of red ink can be used.

Instead of using water, various liquid solutions have been prepared for mixing plaster of paris. Their object is to control the setting time, and to prevent expansion of the material during setting.

ZELEX

When set this most useful impression material remains elastic and does not harden. Consequently it will reproduce with great accuracy all but the most gross undercuts. It is therefore invaluable for taking impressions where natural teeth remain. Such cases are known as " partial " cases. Where there is an absence of teeth, cases are referred to as " full " cases.

Zelex takes the form of a pink powder, not unlike plaster of paris in appearance. When thoroughly mixed with the correct quantity of water it forms a soft pliable dough-like material which sets but does not set hard, like composition or plaster. It must be thoroughly mixed with its own weight of warm water, and for this purpose a simple balance is supplied, with a deep metal bowl on either side. For an impression of average size, one bowl should be half-filled with Zelex powder, and tepid (not hot) water added to the other bowl, until the weights are equal. The water is then poured into a rubber plaster bowl, and the Zelex added, and both mixed thoroughly until there are no lumps. The resulting soft pliable dough-like mass is next placed in a suitable tray, which has been heated and covered with a thin layer of sticky wax. The material is then smoothed into position with a wet finger, and is ready for insertion in the mouth. Impressions in this material should remain

in the mouth at least three minutes before removal. Immediately a Zelex impression has been taken it must be cast, otherwise a faulty model will result, as this material tends to alter its shape in a comparatively short time.

DENTOCOLL

This is described as an " elastic hydro-colloidal " material, but it has been almost entirely superseded by Zelex. It also sets like a stiff elastic jelly, does not harden and remains elastic. It is therefore used for " partial " cases for the same reason. The preparation of this material, however, is much more complicated than Zelex.

Dentocoll is supplied in the form of cylinders or cartridges, which are made to slip into the special mixing syringe. The cartridges are supplied in tins, specially designed to prevent loss of water-content. These must be kept properly closed. The syringe has two plungers, one perforated for mixing, and one solid for expelling the material.

Heating and Mixing.—The base cap of the syringe should be unscrewed, and both plungers fully withdrawn. The cartridge is then inserted, and any space remaining filled with water. After replacing the cap, the charged syringe is placed in the electric boiler (specially supplied for the purpose) containing already boiling water. The water must not be allowed to come over the top of the barrel. The syringe is left in the boiling water for four minutes, and on removal, the mixing rod is worked up and down about a dozen times. The syringe should be held in the felt sheath supplied for the purpose, to prevent scalding the hand.

Cooling.—The syringe is placed in tepid (not cold) water in the wash-basin for a few seconds, and again mixed vigorously. This is repeated two or three times, and cooling finished *slowly* in the hand without further immersion. When sufficiently cool, it should be possible to hold the barrel against the cheek. If the material runs out after unscrewing the cap, it is too hot. It should be free from lumps, glossy and able to hold its own weight. When ready, the content is expelled into the impression tray with the ejecting plunger. Special perforated trays are used. Before insertion in the mouth, the surface of the material is smeared with vaseline.

The impression requires cooling in the mouth. This must be done by the dental surgery attendant, as the operator will require both hands for holding the tray in place.

Immediately prior to the insertion of the tray, the patient should be given a mouthful of *cold* water. He is instructed to retain this until the operator is ready, when it is expelled. When the tray is inserted in the mouth the dental surgery attendant must at once start cooling. This is done with a water syringe, or by a gentle flow of water from a rubber tube, attached to the fountain spittoon. The stream of water should be directed all round the impression. The area between the cheeks and the tray should not be missed. Care should be taken to avoid an ill-directed flow on to the soft palate, which will cause the patient to retch. The patient should be told not to swallow, and should hold a kidney-dish under his chin into which he can dribble.

Dentocoll, unlike Zelex, may be used several times. Used impression material is cut into small pieces, packed into the syringe, and prepared as before. As

the material rapidly loses its water content if left in the open air, all impressions and scrap must be kept in a special glass vessel, called the " Hygrophor," which is designed to prevent such loss. Impressions, of course, must be cast with the least possible delay, but the " Hygrophor " should be used to keep impressions in until they are cast.

SUMMARY OF IMPRESSION MATERIALS

MATERIAL	CHIEF USES	NECESSARY ACCESSORIES	REMARKS
COMPOSITION	GENERAL.	Suitable trays. Bowl. Very hot water. Non-luminous flame (bunsen or spirit). Vaseline.	Boiling water must not be used. Composition must never be heated in a sterilizer. A large quantity of very hot water should be used.
PLASTER OF PARIS.	GENERAL.	Suitable trays. Plaster bowl and plaster mixer. Salt or alum. Colouring matter. Cold water. Tweezers. Sticky wax and wax knife. Plaster knife. Non-luminous flame.	Plaster must be kept in an air-tight tin. Mixing must be thorough. Air should not be introduced during mixing by " whipping." During casting, blow holes should be avoided by tapping out all air bubbles.
ZELEX.	PARTIAL CASES AND EDENTULOUS CASES WHEN UNDERCUTS ARE PRESENT.	Suitable trays. Sticky wax. Zelex balance. Tepid water. Plaster bowl and plaster mixer. Vaseline. Non-luminous flame.	Water used must not be hot, only tepid. Mix must be thorough. Impressions must be cast immediately after being taken.
DENTOCOLL.	AS FOR ZELEX.	Suitable perforated trays. Non-luminous flame. Dentocoll syringe. Dentocoll boiler. Vaseline.	Dentocoll must be heated thoroughly before mixing, and cooled slowly afterwards. Impressions must be cast immediately after being taken. The syringe must be dismantled, and carefully cleaned after use.

CHAPTER 10

CASTING MODELS

WHEN an impression has been taken, the model should be cast as soon as possible. All impressions are fragile and if broken will have to be re-taken. Casting reduces the chances of damage to a minimum. With Zelex and Dentocoll it is essential to cast the model at once. Whatever material is used for the impression, the actual procedure of casting the model in plaster of paris is the same. Before casting plaster impressions, however, they must be soaked in cold water for five minutes, and the surface then soaped thoroughly, using liquid soap and a soft brush for the purpose. All surplus soap must be removed afterwards in running water. It is helpful to run a line of wax around the edge of the plaster impression before casting, to act as a guide when removing the impression from the cast model.

To mix plaster of paris, a rubber plaster bowl is first filled one-third full with cold water. Plaster of paris is then sprinkled slowly into the water, until the surface of the water is covered with little or no water showing. When small cracks appear on the surface, water and plaster are mixed thoroughly, care being taken that no dry portions of plaster are left, and that air bubbles are not introduced by " whipping " (as in beating an egg) during mixing.

To cast an impression, it is first dipped in cold water, and the excess drops gently shaken off. A little of the mixed plaster is then placed in the impression, and the tray gently tapped on the edge of the plaster bench, until all surfaces of the impression are covered with a small amount of plaster. All this plaster is then shaken out of the impression, except for a thin film which will remain. Again a small amount of plaster is placed in the impression and the tray gently tapped on the bench, at the same time more and more plaster being added until the impression is full. A suitable amount of plaster is then placed on a piece of paper on the bench to form a mound. This plaster should be about ¾-in. to 1-in. high. The filled impression is turned upside down, and placed on top of the plaster mound on the bench. It is important that the tray should be kept parallel to the bench surface, so that the resulting model will be neither lop-sided, nor tilted back or front. The plaster is then shaped up to the edges of the tray with a plaster knife, and left until set.

When using plaster, either for impressions or for casting models, a strong plaster free from air-bubbles or blow-holes is aimed at. This is achieved by avoiding the introduction of air due to " whipping " during mixing, and when casting models by thoroughly tapping the tray on the bench until no further bubbles rise to the surface. Frothy soap must not be left on the impression before casting.

When dealing with an impression which has isolated teeth standing—for example a lower jaw with only the natural canines remaining—the solitary teeth must be re-enforced to prevent their breaking off. This is done by fixing a pin or wire into the impression before casting. An ordinary pin cut to a suitable length will do. It can be heated and stuck into a composition impression, stuck into Zelex or Dentocoll, but must be fixed with sticky wax in a plaster impression.

REMOVING IMPRESSION MATERIALS FROM MODELS

Composition

The model, with the impression and tray, is placed in very hot but not boiling water, and left for several minutes, after which the tray and composition are removed when the latter is quite soft. If an attempt is made to remove the composition before it is quite soft, the model, especially if there are any plaster teeth present, is liable to be damaged.

Plaster of Paris

The plaster is trimmed from the edge of the tray, which is then removed by gently tapping the handle with a rivetting hammer. The model and the impression are then placed in hot water for a few minutes.

The junction of the impression can easily be seen by the line of wax which was added prior to casting.

Next, the whole exposed surface of the impression is gently tapped with a rivetting hammer. Gentleness is essential. When it is obvious by the sound that the impression is not adhering to the model, an attempt is made gently to prise the impression from the model with a wax knife, but undue pressure must not be used. In the majority of cases a portion of the plaster impression will break off quite easily, and the remaining portions can then be removed. Care must be taken not to scratch or damage the model. The advantage of colouring the original plaster, when taking the impression, will be appreciated to the full when removing the impression from the model.

Zelex and Dentocoll.

Zelex and Dentocoll never become hard, and may be removed from the model when the plaster has set properly.

When the impression material, whatever it may be, has been removed, the model must be neatly trimmed with a plaster knife, and the name and case number of the patient written clearly on the *side* and not the bottom, of the model.

CHAPTER 11

CONSTRUCTING BITE-BLOCKS

A BITE-BLOCK is a temporary structure and consists of a wax or composition base made to fit either jaw, and resembles a denture, but instead of teeth, having a roughly semi-circular ridge of wax following the alveolar ridge. When dentures are being constructed, bite-blocks are required to register the correct relative position of the two jaws, as shown when teeth are in normal occlusion. However well-fitting and aesthetic dentures may be in themselves, they will obviously prove unsatisfactory if the position of the lower teeth bears an incorrect relationship to that of the upper. A register of the correct " bite " is therefore a very important matter. Well-made bite-blocks are of the greatest assistance to the dental surgeon in this difficult step. Rough ill-fitting ones may well lead to an incorrect result.

To make a bite-block, the model is first dipped in cold water for a short time. This prevents the wax from sticking to the model. A sheet of standard pink wax or composition base plate material, rather larger than the area of the model, is warmed over the flame of a bunsen or spirit lamp until it is quite soft. On no account must it be heated until it begins to melt. The softened wax or base plate material is placed on the model, and moulded with the fingers over that portion of the model which will eventually be covered by the denture. The edges must then be trimmed to conform to the shape which the finished denture will assume. Next a sheet of wax is heated until soft, and folded into a solid roll about $\frac{1}{2}$-in. in diameter, and as long as is necessary. With the fingers and a wax knife, this block of wax is fixed to the base, over that portion of the alveolar ridge which is to carry artificial teeth. It is then trimmed with the wax-knife and heated wax added where needed.

If wax rather than composition base plate material is used for the base, it requires some form of reinforcement as it is a fragile substance. For the lower jaw this is done by bending and embedding a piece of stiff wire in the bite block. For the upper jaw a piece of base metal is cut into the form of a broad letter T, which is fixed to the wax in the palate by heat. The top or cross section of the T should be as near as possible to the posterior margin of the bite block.

The actual height and shape of the bite block varies with the technique of the dental surgeon concerned. A good general rule is to make the wax ridge a little higher than the height of an average tooth. The wax ridge should always be placed directly over the plaster ridge of the model. It is important, however, that the upper bite block should be so constructed, that it bears the best possible relationship to the lower. It sometimes happens that the upper ridge is so much smaller than the lower, that if both blocks were strictly on the ridge, the upper would fall entirely within the lower in the closed mouth position. In such a case, a compromise must be effected to ensure approximation of the wax ridges. When finished, the bite block must be neat in appearance. The edges must be smooth. Clean cut wax when cold and hard can be very painful in the mouth, and may even cut the gums. The bite block must be stable, and should not rock on the model when finger pressure is applied to either side.

CHAPTER 12

THE CONDUCT OF GAS CASES

CASES involving the administration of nitrous oxide gas (gas cases) call for very smooth co-operation between operator, anaesthetist and dental surgery attendant. When the administration is not continuous, the working time is usually all too brief, so that split seconds are of value and fumbling becomes a crime. The dental surgery attendant will see to it that the gas apparatus is in thorough working order, and that all things which will be, or may possibly be, required are in readiness. The gas apparatus consists of two coupled cylinders, rubber bag, valve mechanism and face piece. A nasal attachment is used when continuous administration is employed. The cylinders are coupled so that if the flow from one ceases during administration, owing to emptiness or obstruction, the other may be brought immediately into use. It is of the utmost importance in this connection to have a definite routine. One cylinder should bear a tally " full," and the other " in use." When the " in use " cylinder gives out during administration, the other is brought into play, and the first duty of the dental surgery attendant after the operation will be to remove the empty cylinder, replace it with a full one, and *change over the tallies.*

Before every administration, the dental surgery attendant should test both cylinders with the opening key, to be sure that they can be opened readily. He will be able to estimate the quantity of gas in the " in use " cylinder, by the loudness of the hiss emitted by the flow of gas when the cylinder is opened. If it emits a mere sigh, it should be discarded as empty. The amount of gas in a cylinder may be calculated by weighing it. The dental surgery attendant will see that the anaesthetist's tray is supplied with the necessary gags (Fergusson's and Hewitt's), a tracheotomy outfit, swabs or sponges in holders, and a glass hypodermic syringe and needles for the injection of such drugs as may be required in an emergency—usually strychnine sulphate, either in tablets or in " Tubunic " form, whichever is preferred. Amyl Nitrite ampoules and Sal Volatile should also be available. A reserve supply of small swabs or surgical sponges should be in readiness in a large basin of normal saline solution.

The dental surgery attendant should submit his hands to prolonged scrubbing before a gas case. During induction unnecessary noise and clatter of instruments should be avoided, as this may have an adverse effect on the tranquility of the anaesthesia. If difficulty is experienced in seeing the site of the operation owing to haemorrhage, the dental surgery attendant may be called on to swab. The swab is squeezed dry and inserted in the holder, and the swabber will, when told, press quickly and firmly on the bleeding area and rapidly withdraw. If available, another assistant should be employed to wash out and replace swabs in the holder, and keep the swabber supplied.

After the operation the patient should be allowed to recover slowly. When he is fit to be moved to a recovery room, he should be allowed to remain there until he is quite fit to look after himself, and until the bleeding has quite

stopped. Should the dental surgery attendant have any doubts as to the patient's condition, he must immediately consult the dental or medical officer.

Before the gas apparatus is put away, the cylinder taps must be tested to see that they are properly shut off. Failure to do so leads to much wastage of gas. The rubber bag and tubing, and the face piece and rubber pad must be washed and dried, and a little French chalk rubbed on their surfaces. The valves in the three-way stopcock should be examined from time to time, to see that they are working properly. All rubber tubing should be secure and, if necessary, wired on. (Nothing is so alarming to the patient as the blowing off of tubing during the induction period. He is in a hyper-sensitive state and very susceptible to suggestion.) The rubber pad is made to slip on and off the celluloid or metal face piece. This should always be done after use, and the face piece washed thoroughly in a mild antiseptic solution. These pads are of different sizes, numbered 1, 2 and 3. Great care should be taken to see that the correct sized rubber pad is replaced on the face piece. If the pad is loose an air leak will occur during administration, with consequent failure of anaesthesia.

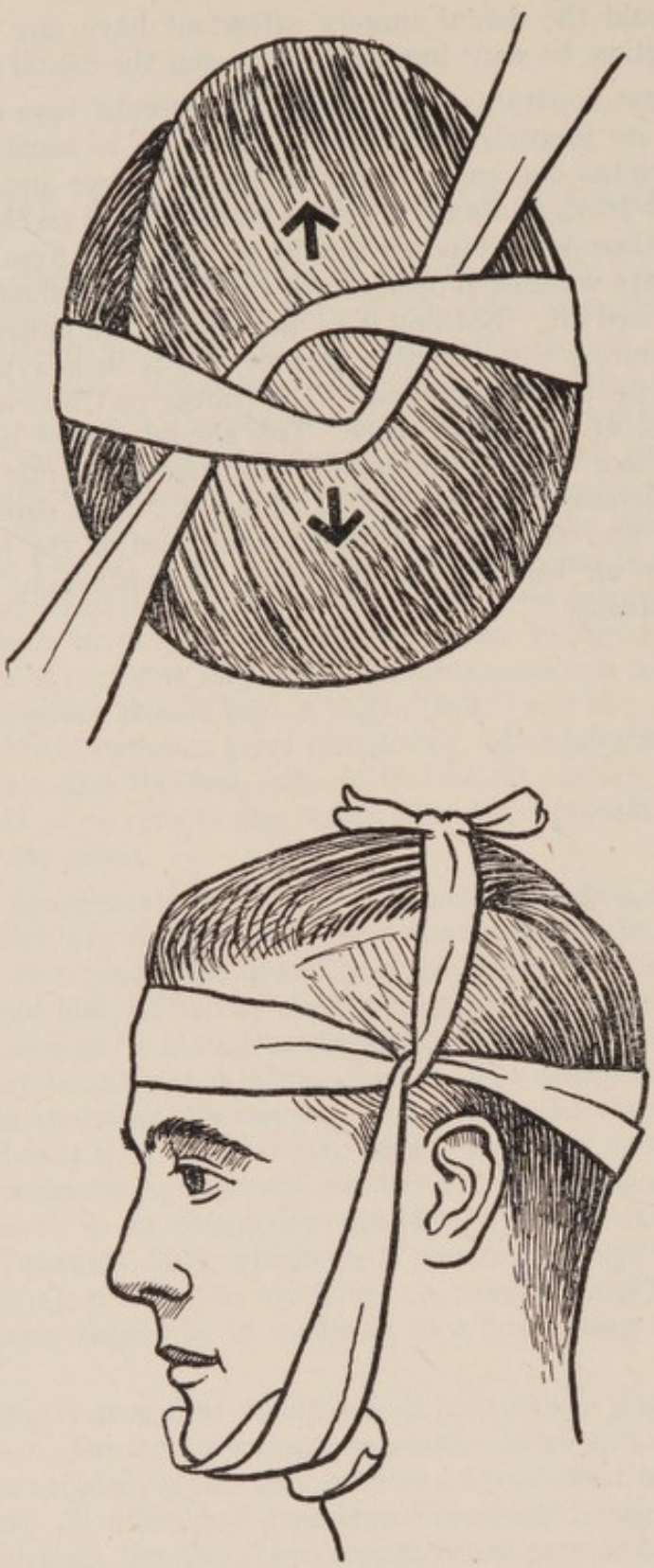


Fig. 11.—Barrel Bandage

CHAPTER 13

DENTAL FIRST AID

FRACTURED LOWER JAW

THE dental surgery attendant, being conversant with first aid, will remember that matters of paramount importance are the arrest of haemorrhage, the keeping of the air passages clear, the treatment of shock, and the control of pain. It should be remembered that in some cases of badly fractured mandible the muscles attached to the jaw may lose their firm anchorage, so that the tongue and surrounding structures, owing to lack of their normal control, may cause obstruction of the air-passages. It is very improbable that this will occur if the patient is placed *face downwards*. Cases have been recorded of death occurring from asphyxia, owing to the position of the patient having been altered from face downwards to lying on the back. Should sedatives of the morphine group be administered a label showing the drug used, and the dosage and time of administration, should be attached to the patient. The dental surgery attendant should not attempt reduction of the fracture, but should be content with protecting the tissues from further damage and infection, and with controlling gross mobility of the injured parts. This latter is best effected by application of the **Barrel Bandage,** described as follows.

Six feet of 3-in. bandage is unrolled, and the centre placed under the patient's chin, supporting any necessary dressing. The ends are entwined in a single twist on the crown of the head. Retaining the ends loosely in the hands the twist is loosened and the two loops are pulled, one towards the forehead, and the other towards the back of the head. They are eased into position so that they encircle the head, one round the forehead, and the other round the occiput, where the skull meets the neck. The crossovers should be arranged so that they come just in front of and above the ears. After tightening up as necessary, the ends are tied firmly on top of head, care being taken to see that they are not too far forward. The part under the chin must be as far back as possible, short of interfering with swallowing. Sticky dressings should not be used over areas where there is likely to be a growth of hair. A beard grown into such a dressing, will make the removal of the dressing extremely painful and difficult.

To combat shock in cases of severe injury, warmth, rest, and the giving of hot sweet drinks are indicated.

TOOTHACHE

The usual dental conditions calling for first aid are acute toothache, persistent bleeding from a tooth socket, and post-extractive pain. Skilled assistance should be sought as soon as possible, but when the services of a dental officer cannot be obtained quickly, the dental surgery attendant on duty may be able to arrest haemorrhage and sufficiently control pain until other measures are taken. Toothache may be caused by an inflammation of the pulp, of the periodontal membrane, or by both.

In **pulpitis** (inflammation of the pulp) the pain may be severe, but the tooth will be firm and not tender to bite on, nor painful on percussion. Pain may be controlled by inserting a sedative dressing, such as carbolized resin, cotton-wool dipped in "Dentalone" or oil of cloves, or by placing in the cavity a paste made by mixing oil of cloves and zinc oxide—the paste should be as stiff as possible. It may not be possible to see the cavity, in which case it is probably in the side of the aching tooth and concealed by the next. In this case the dressing should be inserted between the two teeth concerned.

Periodontitis (inflammation of the periodontal membrane) is usually a symptom of a more advanced condition. The pulp may have died and become septic, and the infection, progressing through the end of the root, will have resulted in an acute inflammation of the periodontal membrane. The inflammation causes great pain with tenderness on biting, and may proceed to alveolar abscess and swelling, with temperature and a general feeling of being unwell. If it is clear that the condition is of this nature and not a simple pulpitis, nothing should be inserted in the cavity, otherwise the sepsis will be bottled up and the severity of the condition may increase. Very hot mouth-washes combined with simple sedatives may bring relief. A foment, consisting of a cotton-wool roll dipped in boiling water and well squeezed out to avoid scalding, is comforting if applied to the gum in the affected area. Large external foments should not be used, however, for if abscess formation is likely there is a danger that the infection may be drawn into the deeper tissues, or that the abscess may burst externally through the cheek leaving a disfiguring scar.

HAEMORRHAGE AFTER EXTRACTION

Haemorrhage may prove a serious condition, especially if the blood does not appear to be clotting, and skilled treatment should be sought without delay if the bleeding is either copious, or persistent, or both. The dental surgery attendant, however, while waiting the arrival of assistance, must do what he can to alleviate the condition. His first duty is to reassure the patient, and he must therefore show no signs of alarm himself. In many cases fear and hunger are potent factors in haemorrhage. The writer remembers a case where it was discovered that the patient abstained from food for nearly twenty-four hours, because of his alarm at post-operative bleeding. He was assured that if he stopped worrying and had a good meal the haemorrhage would cease. He returned after a good lunch to report that, to his astonishment, the trouble had ceased. This case, however, must be regarded as exceptional.

In treating haemorrhage a good light on the scene is essential. First, the mouth should be freed from blood and any clot present, and the source of bleeding located as exactly as possible. The rate of flow should be observed, and the tendency or otherwise of the blood to clot noted. In a high percentage of cases of post-extractive haemorrhage, the bleeding does not come from the depth of the socket, but from torn tissues on the surfaces, especially where the gum has been separated from the underlying alveolar bone. Plugging of the socket in these cases is useless. If the blood appears to be pumping or pulsing out, it is a sign of arterial bleeding, and a small vessel is probably half-severed and unable to close. Gentle curettage of the site of bleeding with a suitable instrument, such as a small straight spoon excavator, should be tried first. This may complete severance of the vessel and allow it to close, when

the bleeding may stop without further treatment. In ordinary cases where the blood is oozing the patient should be made to bite firmly on a pad of cotton-wool or a folded dental napkin, steeped in cold water or adrenalin hydrochloride. The patient should be kept quiet, and the amount of haemorrhage noted from time to time. If this treatment is insufficient, and it appears that the bleeding is from the socket itself, firm plugging of the socket with ribbon gauze should be carried out. Often in the end the quickest method is for the dental surgery attendant to sit by the patient, maintaining pressure with his own fingers on the dressing for twenty minutes to an hour. This calls for patience and endurance, but is often successful. Trying many methods in rapid succession should be avoided.

Useful drugs to control bleeding, known as **styptics,** are hydrogen peroxide, adrenalin hydrochloride, carbolized resin, oil of turpentine, and tannic acid. These drugs may be used in conjunction with ribbon gauze plugging. The patient must be cautioned against undue exertion or rapid movement, against taking alcohol, and he should be instructed to sleep with his head as upright as possible. He must not be dismissed until it is quite certain that blood has ceased oozing. The plug of gauze in the socket should not be disturbed until the patient can be seen by the dental or medical officer. Such drastic styptics as tinct. ferri perchloridi should be employed only in experienced hands. There are dangers associated even with oil of turpentine. With surface bleeding from lacerated gums, the application of dressings soaked in very hot hydrogen peroxide may be effective, care being taken not to scald the patient's lips or cheeks.

PAIN FROM A TOOTH SOCKET

Pain may be experienced from the socket of a recently extracted tooth. If the pain follows very shortly after the removal of the tooth, little should be done beyond the local application of tincture of iodine, the administrstion of a mild sedative (Aspirin 10 grains) and the recommendation to avoid cold air. Warmth is soothing, and may be applied externally by a hot water bottle or a foment. Should the pain occur some considerable time after extraction, the socket should be examined. A normal healthy clot of blood in a tooth socket should never be disturbed. However, it may be found that the clot is absent, or has degenerated, and that the socket has become septic and has an offensive odour. In this case, the socket should first be swabbed gently with pledgets of cotton-wool to remove as much septic debris as possible. It should then be syringed gently but firmly with a mild antiseptic or saline solution at body temperature, followed by the insertion either of a dressing, such as cotton-wool dipped in oil of cloves, or a paste made of zinc oxide powder and oil of cloves and white vaseline, or a paste made of bismuth and iodoform and paraffin. The latter preparation, known as B.I.P., is particularly valuable in the more septic conditions. Cotton-wool dressings must not be kept in a socket for more than forty-eight hours. The patient should be brought before the dental officer at an early opportunity.

CHAPTER 14

DENTAL RADIOGRAPHY

APPARATUS

X-RAYS were discovered by accident at the end of last century by Roentgen. He happened to place a fluorescent tube on a book, together with a bunch of keys. Under the book, by chance, was a photographic plate in its shutter. When this plate came to be developed, a shadow image of the keys was found on it. This led to the discovery that certain rays emanating from a fluorescent tube could penetrate substances impervious to ordinary light. These rays were called by their discoverer X-rays.

Before the discovery of X-rays, it was known that when light is broken up into its component parts by passing it through a prism, the rays which we see—namely, the colours of the rainbow or spectrum—have light waves of different lengths. The red at one end of the spectrum has the longest wavelength, and violet at the other the shortest. Moreoever, the shorter the wavelength of the ray, the greater is its penetrating power. The discovery of X-rays led to the further discovery, that there are rays at either end of the spectrum which we cannot see. At one end are the infra-red rays, with waves longer than the red; and those waves used in "wireless," which are longer still. At the other end are the ultra violet rays, with waves shorter than the violet; and X-rays, with waves shorter still and therefore more highly penetrative.

The extent to which X-rays penetrate a substance depends upon its thickness and density. When an X-ray picture is taken, the rays which are passed through the body are used to act on a photographic emulsion on a film, and thus are seen the shadows of the objects through which the X-rays have passed.

X-rays are produced from a tube containing two electrodes in a partial vacuum. A stream of units of negative electricity (electrons) is passed with terrific force from one electrode on to the other or "target," which consists of a piece of very hard metal set at an angle. On striking the target, the electrons give rise to penetrating X-rays.

In the modern dental X-ray apparatus, the tube is carried on a bracket, so designed that it can readily be placed in any desired position and at any angle. The rest of the apparatus consists of a cabinet, where the voltage from the mains is "stepped up" to the necessary height for operating the tube, an automatic time switch to control exposure, and controls for the voltage and milliamperage. A **volt** is the unit of current pressure. An **ampere** is the unit of current flow. The current is controlled by turning a knob, the pointer of which moves over a dial. The correct position for the pointer is usually indicated on the dial by an arrow or red line. The pointer must be set at this position with the machine running, before an exposure is made. A table, showing the correct exposures for the various teeth is usually to be found on the time switch. The table also indicates the times required for the different speeds of film (regular, radiatized and extra fast). These times vary from the nine seconds, required for an upper molar in a massive jaw, using regular films, to the one second, required for a lower incisor with extra-fast film.

The usual dental films are 1⅝-ins. by 1¼-ins. in size. They are wrapped in pairs, the covering being impervious to ordinary light, but not to X-rays. It is therefore important, both before and after exposure, to keep them in a lead container, which will protect them from stray X-rays from the machine, and so prevent them becoming " fogged." X-rays do not penetrate lead, and that is why these containers are made of this metal. One side of the film wrapping is pink in colour, and this side should face the tube when an exposure is taken. Every film is embossed on one corner. The raised or embossed side is the one which has faced the tube, so that when the developed X-ray photograph is examined, it shows clearly to which side of the jaw it refers. An X-ray photograph is known as a **radiograph** or a **skiagraph,** the latter meaning a " shadow picture."

TAKING AN X-RAY PHOTOGRAPH

When taking X-ray photographs, it is preferable to have the patients in certain constant positions. For upper teeth, the patients should be so placed that a line drawn from the actual ear-hole to the nostril is parallel with the floor. For lower teeth, the head should be tilted further back so that the parallel line runs from the ear-hole to the angle of mouth.

Any dentures worn by the patient must be removed. The film is then placed in position firmly against the teeth concerned, either on the palatal or lingual side of the alveolar process, according to whether the teeth are upper or lower. Care must be taken to ensure that the ends of the roots of the teeth, and a little beyond as well, will be included. It must be remembered that it is a picture of the roots particularly which is required rather than of the crowns of the teeth, which can be seen with the naked eye.

Some difficulty may be experienced in positioning the film for an unerupted third lower molar, especially if the mouth can be opened only a little way. It is very important to get the film as deep down and as far back as possible. It is easier to do this if the patient is instructed not to open too widely, and to keep the floor of the mouth relaxed. The film may be bent at a corner to allow of comfortable positioning.

It is usual to make the patient hold the film in position with the forefinger. This done, the tube must be positioned correctly, and the patient instructed to keep quite still. The radiographer stands well away from the tube, out of the direct line of the rays, and presses the button of the time switch, which he has previously set.

On no account must he make a routine practice of holding the films himself in the patient's mouth, or of standing too near the tube, or in direct line with its rays. Such a practice may lead to distressing X-ray burns, anaemia, and even sterility through continued exposure to the rays. It is easy to be careless in this matter, because serious results are not immediate, and do not become apparent until long after exposure.

Films may be grasped in Spencer-Wells forceps, or special film holders (which are preferable), may be used.

The " target " of the X-ray tube should be at a constant distance from the object to be photographed. This is achieved by having a cone on one end of

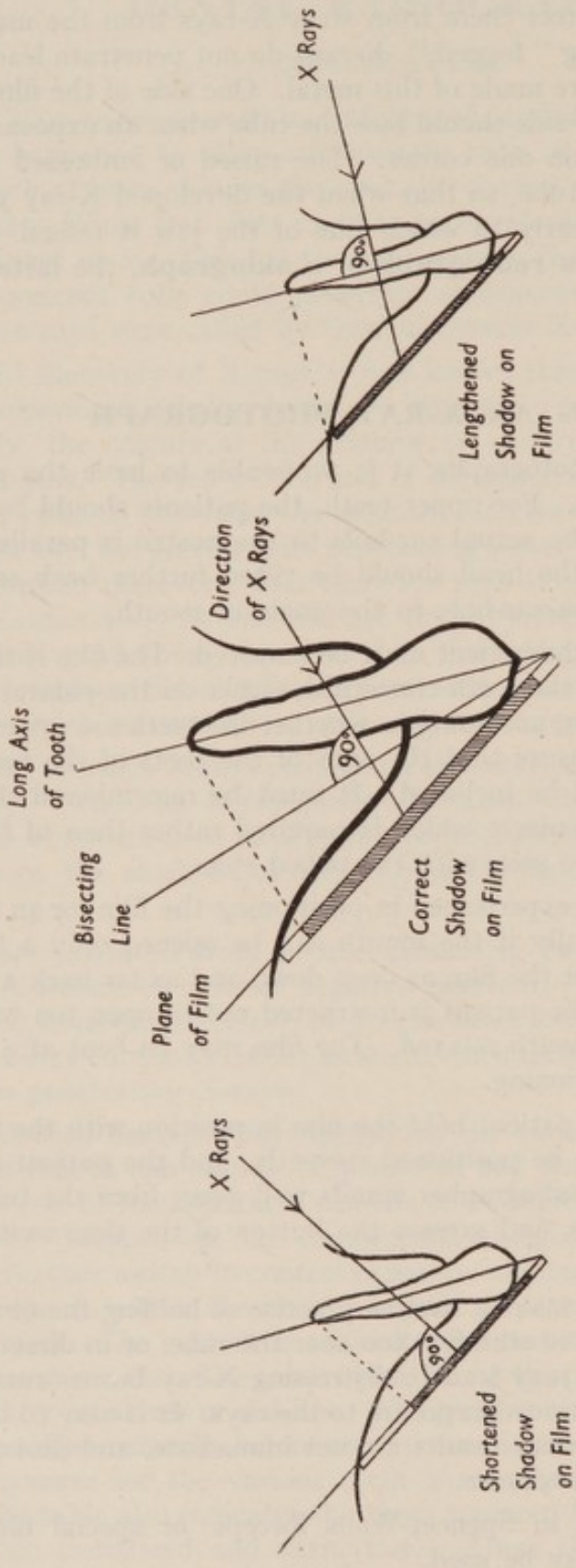


Fig. 12.—X-Rays—Correct Angle

the tube. If the tip of this cone just touches the skin, the distance between the target of the tube and the object will be correct.

In order to avoid a distorted picture, it is essential that the tube be placed so that the X-rays form a right-angle with a line which bisects the angle made by the film and the long axis of the tooth. If it is remembered that shadows are being photographed, it will be obvious that this position will strike an average between elongation on the one hand, and foreshortening on the other.

Similarly, if a picture of the alveolar process without teeth is being taken, the X-rays should be directed at right-angles to a line which bisects the angle made by the film and the long axes of the sockets of the missing teeth.

Not more than three teeth can be recorded on one film without distortion, and where a complete set of X-ray films of the whole mouth is required, from five to seven films will be necessary for each jaw. When multiple exposures are being made it is particularly necessary immediately to place exposed films in a lead box, to protect them against rays from the repeatedly used tube.

Another form of film is known as the " bite-wing." This has a paper wing on which the patient bites to maintain the position.

In addition to the intra-oral technique described above, in which a small film is placed *in* the mouth, large photographs may be required for cases of fractured jaws, necrosis, cysts, impacted molars, etc. In this case an extra-oral technique is employed, and a large film is used *outside* the mouth. The film is contained in a **cassette,** which is provided with a fluorescent or intensifying screen, the object of which is to reduce the exposure time.

The patient lays his head as directed on the cassette, in the correct position for the desired result. This positioning, which forms a special study, is of the utmost importance, in order that clear photographs, unobstructed by superimposed structures, may be obtained.

The dental surgery attendant will not be held responsible for the correct reading of films, nor be expected to make a diagnosis from them, but he should take an intelligent interest in this, and be able to spot an " artefact " from an actual condition. That is, he should know the appearance due to faulty film or bad development.

PROCESSING X-RAY FILMS

The developing of X-ray films, or " processing " as it is more accurately described, is similar to that of ordinary photographic film, and is undertaken in a Dark Room with the aid of a lamp fitted with a " Safelight." It entails five stages—developing, rinsing, fixing, washing, and drying. Correct processing is just as important as correct exposure in securing a satisfactory X-ray photograph. In fact, a correctly processed film will indicate whether it has been under or over-exposed, a negative lacking in density indicating the former and a dense negative the latter.

The Dark Room must be *dark*. The light-tightness of the room should be checked before film packets are opened, and it is advisable to wait at least one minute after turning off the lights before making the check. Exposure

of films to any stray beams of light, or even holding the films too near the " Safelight," will cause " fogging." In this connection, it is important to ascertain that the electric bulb in the Dark Room Lamp fitted with the " Safelight " is the correct wattage as specified by the makers of the latter, and that the " Safelight " itself is not cracked or damaged.

The Dark Room must be kept clean and any spilled liquids mopped up at once.

In the tank method of processing, three tanks are used. One with a lid for developing, one for rinsing, and one for fixing. Developing and fixing solutions of normal strength are prepared from the packets of chemicals provided, the instructions on the packets being carefully followed. The chemicals must be allowed to dissolve completely before the solutions are used, and solutions must not be overworked or used when stale. The rinsing tank is filled with water. The same tanks are always used for the same purpose, and they must be washed thoroughly before they are filled with fresh solutions. It is advisable to stir the developing and fixing solutions before use to ensure uniform processing, a separate stirring rod being used for each tank.

The developing solution must be used at a temperature of 65° Fahrenheit. This is important. The solution is raised to the required temperature by the use of an electric Immersion Heater which is placed in the liquid. Alternatively, the filled tank may be placed in hot water for a short while. The temperature of the solution is checked with a thermometer immediately prior to use. In exceptionally cold weather the fixing solution and rinsing water should be warmed also, as too great a difference between their temperature and that of the developing solution will cause " frilling " of the films.

Developing

The films requiring processing are carefully unwrapped in the Dark Room. They must not be creased, or the emulsion on the film marked with the fingers. After unwrapping, they are held at opposite edges between the thumb and forefinger and clipped on to a film hanger. The hanger and films are then immersed in the warm developing solution, and moved up and down once or twice to dislodge any air bubbles. At the same time, an alarum or special clock is started to measure a five minute period. With normal strength developing solution at 65° Fahrenheit, the developing time is five minutes. It is possible to develop with solutions between 62° Fahrenheit and 68° Fahrenheit, but in these cases 20 seconds must be added to the developing time for every degree below 65° Fahrenheit, and 20 seconds subtracted for every degree above 65° Fahrenheit. The lid of the tank is put on during developing, and only removed when, for a few seconds every minute, the films are agitated in the solution to prevent uneven development. Using a normal solution developing is complete after five minutes, and the hanger and films are removed from the tank.

Rinsing

The films on the hanger are then held under running water (if available) for about 30 seconds, or agitated in the rinsing tank for the same period, after which they are removed.

Fixing

The films are transferred to the fixing solution (normal strength) where they should remain for ten minutes. During this time they should be gently agitated every two minutes. It is safe to admit full light in the Dark Room after the films have been in the fixing solution two minutes.

Washing

After the films are fixed, they are removed from the tank and washed under running water for about 30 minutes. If running water is not available, still water may be used, but it must be changed at least eight times, and the films kept in each change of water for five minutes.

Drying

Films in the wet state are easily damaged, and must be handled with great care. Still on the film hanger, they are dried by hanging them in a current of air in a place free from dust. If desired, drying may be accelerated by immersing the films in spirit for about a minute, afterwards hanging them up in the draught from an electric fan.

Part III
THE CLERICAL DUTIES OF A SURGERY ATTENDANT

CHAPTER 15
INTRODUCTORY REMARKS

THE clerical duties of a dental surgery attendant involve a knowledge of all existing regulations and orders affecting the dental department. He should make himself familiar with current Admiralty Fleet Orders directly or indirectly affecting the dental department, and all relevant Articles of King's Regulations and Admiralty Instructions, so that he may know what action should be taken in different circumstances. In this connection, he must also be familiar with current memoranda from the Medical Director-General, relevant sections of the Commander-in-Chief's Orders, Port-General Orders, Barrack's Standing Orders or Instructions, the Command, Staff or Fleet Dental Surgeon's Instructions and the Senior Dental Surgeon's Order Book. In addition, he should be familiar with the provisions of the Dangerous Drugs Act as it affects the dental surgeon.

The competent dental surgery attendant should keep an Order Book, containing copies of all orders and instructions relating to dental matters, obtainable from the sources given above. He will ensure that the dental department is regularly minuted with current Admiralty Fleet Orders, amendments to King's Regulations and Admiralty Instructions, and other appropriate orders, and from this information keep his Order Book up to date.

He should have a thorough knowledge of all forms used by the dental officer, and should understand the compiling of returns, seeing to it that such returns are submitted at the right time, through the correct channels. He will be conversant with, and capable of carrying out, the system of recording dental operations.

He must be capable of demanding and accounting for dental stores, and be familiar with the procedure for holding surveys.

He should be capable of drafting a routine service letter, and should be familiar with the correct forms of address. Typing is a very useful accomplishment, which should be practised when there is an opportunity.

While the dental officer is responsible for seeing that regulations are complied with, a dental surgery attendant who can be relied on not only to perform these tasks when told, but to know for himself what should be done in various circumstances, is invaluable, and releases the dental officer for purely professional duties.

The clerical duties of a dental surgery attendant are less formidable in practice than the foregoing might suggest. Nevertheless, it is essential that these duties be carried out in accordance with instructions, and with the utmost accuracy. Inaccuracies lead to avoidable queries and correspondence, and may have serious repercussions.

CHAPTER 16

RECORDS OF TREATMENT

Dental Treatment Form, Form M.228

AMONG the most important records that have to be kept in the dental surgery are those relating to dental treatment. Individual treatment afforded to patients is recorded on Form M.228. It is a good plan to have all Forms M.228 relating to patients in any particular working session, in readiness on the desk before the session commences. This avoids delay later on, and indicates at a glance what patients are to be seen. When patients are absent, the fact should be recorded in pencil on their form against the date. In the case of patients attending for the first time, their particulars will have to be entered on the form, and as the condition of the mouth may have to be charted, the dental surgery attendant, if required, must be prepared to do the charting from the dental officer's spoken word. Before each patient is dismissed, the treatment afforded is recorded on the form. The various symbols used on the chart to designate treatment undertaken are shown on page 9, Fig. 6.

When not in use, Forms M.228 should be kept in filing cabinets, either in alphabetical order, or in the case of recruits in " class " order. In addition, the file should be divided into sections, one containing forms relating to patients *under treatment*, another relating to those rendered *dentally fit*, and a third relating to those for whom treatment is incomplete, but who are *unavailable* for further treatment.

Forms M.228 in respect of patients for whom treatment is completed, or for whom no further treatment can be undertaken, are forwarded monthly to the patients' filing centres, as shown in current Admiralty Fleet Orders, for insertion in their dental envelopes Forms M.227a.

Daily Diary, Form S.1, and Monthly Return of Dental Operations, Form M.235c

The particulars of treatment given to patients during the day, and shown on Forms M.228, should be entered the same day under the date in the Daily Diary (Form S.1) in appropriate columns ruled out and headed to correspond to those shown on Form M.235c, Monthly Return of Dental Operations. The number of operations performed during the day is then totalled up and carried forward to the next day, and so on till the end of the month. The monthly totals are then used to compile Form M.235c, which records the total work performed during the month. This return is forwarded on the last day of each month through the Command, Staff, or Fleet Dental Surgeon, to the Medical Director-General at the Admiralty.

The particulars given in this return are less extensive than those required for the Annual Statistical Return Form M.235.

Annual Statistical Returns, Form M.235

The Annual Statistical Return, Form M.235 (covers) and Form M.235a (loose leaves) is a nominal list of patients seen by an individual dental officer

in the course of the year, and gives details of treatment afforded to each patient. If the dental officer has held more than one appointment during the year, the return will relate to patients seen in more than one ship or establishment. It is forwarded to the Medical Director-General, through the Command, Staff, or Fleet Dental Surgeon, on the 1st January each year.

The return is kept in sections—one for officers and miscellaneous personnel, one for ratings, and a separate section each for Allied and Commonwealth personnel. As each page is completed, the columns detailing treatment are added up, and the totals carried forward to the succeeding page, and continued in this manner until each section is completed at the end of the year. A summary of the totals of each section must be given at the end of the return, and these added together to show the grand total of work performed by the dental officer during the year.

When patients attend for treatment for the first time, their names should be entered the day they attend under the date, in the left-hand column. Details of treatment afforded are entered daily in the appropriate columns from Forms M.228.

Dental Treatment Envelope, Form M.227a

Form M.227a is an envelope which is designed to accommodate Forms M.228. This envelope is issued at the Training Establishments in respect of each new entry. His dental condition on entry is recorded on the chart on the outside of the envelope together with his particulars. When his training is complete, this envelope is forwarded to the patient's filing centre, containing a record on Form M.228 of any dental treatment he may have received at the training centre. If the new entry has been trained in more than one establishment, Forms M.227a and M.228 are transferred from one Training Establishment to the other, before being finally sent to the filing centre. A list of the appropriate filing centres is shown in current Admiralty Fleet Orders.

Throughout the patient's naval career all dental treatment received is recorded on Forms M.228, which are subsequently forwarded to the appropriate filing centre for insertion in his envelope, Form M.227a. On his discharge, his dental condition is recorded in red ink on Form M.228, and the dental records contained in Form M.227a are forwarded to the Admiralty.

Record of Supply of Dentures, Forms M.234, M.239 and M.229

Form M.234. If the supply of dentures to a patient is necessary, Form M.234 is used. This is divided into three sections. The first two are used to obtain authority for the supply to be made, the first section being filled in when the supply is recommended at the public expense, and the second section if the supply is recommended on repayment. The second section is also utilized to recover the necessary cost of the dentures from the patient, and both sections are used to obtain the patient's receipt when the dentures are fitted. The third section overleaf is used after approval has been obtained, and when the dentures are being constructed. It is used as a record of transit of the models, etc., between the dental officer fitting the dentures, and the dental officer in charge of the dental laboratory, and allows these officers to exchange remarks concerning the case.

This form is an official record of the supply of dentures to a patient, and is subsequently filed with the patient's previous records in his Dental Treatment Envelope, Form M.227a, at his filing centre.

Form M.239. When the supply of dentures has been recommended a notation to this effect is made on Form M.239, and this small form is attached in the patient's Pay and Identity Book. Each stage in the construction of the dentures is recorded on this form, and a notation made when the dentures are fitted. There are, therefore, three official records of the supply of dentures to a patient—one on Form M.234 and another on Form M.228, which are retained with existing dental records at the filing centre, and the third on Form M.239 which is retained by the patient in his Pay and Identity Book.

Form M.229. For record purposes in the dental laboratory, Form M.229 is used in regard to the construction of dentures. The details respecting each case are noted, including the expenditure of materials. The dental technician having entered the necessary information, files the card in the dental laboratory. From these cards are compiled Form M.240.

Return of Dental Appliance Work, Form M.240

At the end of each month, a return of the number of dentures supplied to patients during this period is forwarded to the Medical Director-General on Form M.240, Return of Dental Appliance Work, which indicates the detailed information required.

Dental Appointment Card, Form M.233

Dental patients are given an Appointment Card, Form M.233, on which is noted the date and time of their next appointment. On the front of the form are printed instructions on oral hygiene. The form is retained by the patient until treatment is completed, when the card is destroyed.

The future times of attendance of patients will be noted by the dental surgery attendant in the Daily Diary in pencil.

CHAPTER 17

DENTAL STORES

DENTAL STORE ACCOUNTS

IN common with other stores, dental stores must be accounted for. Such an account is intended to show in detail the transactions that have occurred in connection with the stores over the period to which the account refers. It will show in detail those items and their quantities which have been accepted as being on charge when the account was opened—either as " remains from the previous account " or, if the account is opened for the first time, as the initial issue of stores. To these items must be added all stores received from other sources during the period of the account, in order to determine the *total receipts*. To complete the picture the expenditure of stores must be taken into account also. Stores may be expended in a number of ways—the expenditure of consumable stores during treatment, the issue of stores to another authority, breakages, loss or misappropriation. The total expenditure of stores indicated above will represent the *total issues*. If the *total issues* are subtracted from the *total receipts* the result will show the total stores remaining at the time the account is closed. This quantity is known as the *remains to next account*. To balance the account, the sum of the *total issues* and the *remains to next account* must equal the *total receipts*.

The total issues and the remains to next account are known as *credits*, while the total receipts are known as *debits*.

The principal involved is very simple, and is equivalent to any other " profit and loss " account. The only difficulties that are likely to occur in keeping dental store accounts are those that arise as the result of negligence or carelessness. The necessity, therefore, for accuracy cannot be too strongly insisted upon.

In accounting for dental stores, two systems are used. One involves the use of four account books, **Forms M.230A, B, C, and D.** These refer to a limited period only, usually one year, when the account is closed by survey, and the books are forwarded to the Admiralty for examination. Following the closure of the accounts, a fresh series of account books are immediately opened, these in turn being closed in a similar manner, and so on.

The other is known as the **loose-leaf ledger system.** It has two sections, and is never " closed " by annual survey, although the ledgers are examined by the Admiralty from time to time. This method is more suited to permanent shore establishments, where continuity of store-keeping over an indefinite period is likely. It is simpler, and involves less clerical work, but the use of account books is more suited to ships and small centres.

Dental Store Accounts, Forms M.230A, B, C and D

The four separate books used in this system are designed for accounting stores as follows:—

Form M.230A. Dental Surgery Equipment,
***Form M.230B.** Dental Laboratory Equipment, Tools, and Consumable Stores,
Form M.230C. Dental Instruments,
Form M.230D. Dental Consumable Stores, Medicaments and Drugs.

Full instructions are printed on the inside covers of each book, and if these are followed carefully, there should be no difficulty in rendering a correct account.

Each page is divided into vertical columns, which are headed with the names of the items to be accounted for, and into horizontal columns, which refer throughout the account to items received and issued, from and to, any one source (*i.e.* each line refers to a particular receipt or issue voucher). In addition to these divisions, each page is divided into an upper and lower section.

Receipts.—In the upper section are entered all receipts, starting on the first horizontal line with the remains from the previous account, or if the account is opened for the first time with the initial issue of stores. On the lines underneath are entered stores subsequently received, a separate line being used throughout the account for stores for which a separate voucher has been received from an issuing authority. The particulars regarding each voucher—the authority from whom it has been received, the date, and the number allotted to it—must be recorded on the first page of the account, on the horizontal line to which the voucher refers throughout the account.

Issues.—In the lower section are entered all issues of stores, including the " Remains to next account." On the first horizontal line in this section are entered items " Expended in rendering treatment," following on subsequent lines with items " Lost or broken by accident," " Lost or broken by negligence," " Condemned by Report of Survey," " Returned to Store," " Unserviceable returns to Store," and ending with " Remains to next Account." The particulars regarding each horizontal line must be given in the front of the Account. Thus, the date of the Report of survey, the particulars of each issue voucher, etc., must be entered at the beginning of each particular line.

Balancing the Account.—When the account is closed it must balance. The addition of all entries in the upper or receipt section of the account will give the total receipts (known as total debits), while the addition of all entries in the lower or issue section, including the " Remains to next account," will give the total issues (known as the total credits). These two additions must correspond.

When the account is closed and a new one opened, the quantities shown as " Remains to next account " must be transferred to line 1 of the new account.

Unserviceable Stores.—At the back of each book (where appropriate) is a separate section to account for unserviceable stores condemned by survey (see page 67). The reason for this procedure is that condemned articles must

* Form S.145 may be utilized in lieu of Form M.230B if the latter is out of print.

continue to be accounted for, until authority has been received for their disposal. Such stores must be transferred from line 19 of the main account, and entered on line 2 in the receipt or upper half of the unserviceable account.

The method by which unserviceable stores are accounted for is exactly the same as that used for serviceable stores, and total receipts must balance the sum of the total issues and the remains to next account.

When accounts in Forms M.230A, B, C and D are closed, the unserviceable sections must be closed also. If approval has been received for the disposal of unserviceable items prior to the closure of the accounts (from the Commanding Officer in the case of sea-going ships, or the Medical Director-General in the case of shore establishments) these items are entered in the issue or lower half of the unserviceable account, a notation being made at the commencement of the line on which they are entered as to how they are disposed of (destroyed, returned to store, etc.) and the authority for their disposal given.

Unserviceable stores that have not been disposed of at the time of the closure of the accounts must be entered in the issue or lower half of the unserviceable section, as " Unserviceable remains to next account." This quantity must then be entered in the *new* accounts on line 1, in the upper or receipt half of the unserviceable section, as " Unserviceable remains " from the previous account.

Closure of Accounts.—Accounts of Dental Equipment and Stores, Forms M.230A, B, C and D, are closed by survey, and forwarded to the Medical Director-General annually (*vide* K.R. and A.I.), or earlier when the accounts are closed on the supersession of the dental officer, or if the ship or establishment pays off. They are accompanied by all relevant documents associated with the account, namely, all issue and receipt vouchers, and a copy of the Report of Survey.

Vouchers.—Issue and receipt vouchers will be received and made out on **Forms S.549,** except vouchers received from manufacturing firms, who use **Forms D.55.** Vouchers are *invariably* to be used in respect of any transactions relating to the transfer of stores from one authority to another, and both the issuing and the receiving authority must sign each voucher. When accompanying the accounts, vouchers must be numbered consecutively in the order in which they are received or issued. In order to differentiate between issue and receipt vouchers, issue vouchers should be numbered serially with *odd* numbers, and receipt vouchers serially with *even* numbers. However it is adviseable also to write on each, as appropriate, either " issue voucher " or " receipt voucher." It must be remembered that issue vouchers received from another authority become a *receipt* voucher to the recipient, and should be so marked. It is therefore important that the person keeping the account should indicate clearly whether the vouchers referring to his account are issue or receipt vouchers, as far as he is concerned, in order that there should be no confusion. Issue and receipt vouchers should always be kept separately and pinned together.

If it is necessary to " raise " a voucher for stores lost or broken by accident, **Form M.189** should be used. If the loss or breakage is due to negligence,

Form M.151 is used. If either of these forms is used, it should be marked as an issue voucher, and be dealt with accordingly.

SURVEYS

An official survey of dental stores by independent officers is a necessary preliminary to the disposal of those items on charge which require replacement through wear or breakage, except breakages of china and glass, which should be accounted for on Form M.189.

In connection with accounts in books M.230A, B, C and D, surveys are held annually, or on supersession of the officer in charge of stores, or on the ship or establishment paying off.

Before a survey of stores can be held, authority must be obtained from the Commander-in-Chief or Senior Naval Officer, who will appoint the surveying officers.

Prior to a survey, the dental surgery attendant must collect all those items which it is desired to condemn as unserviceable and have them ready for display to the surveying officers when they arrive. He must prepare in triplicate a list of these items on a **Report of Survey—Form M.8** for shore establishments, or **Form M.176** for ships. The various columns on these forms should be filled in, giving the details required against each item concerning the serviceable and unserviceable quantities on charge. The recommendations as to the disposal of the articles when condemned is noted against each article in the right-hand column. Articles for condemning that have a salvage value, should be recommended to be returned to store, *e.g.* metal articles, etc. Other worn out or broken articles that have no such value, may be recommended to be thrown away.

The surveying officers on arrival will examine the store accounts and the serviceable stores. They will then inspect the unserviceable items and if, satisfied that they are in fact unserviceable through fair wear and tear, or through breakage, and that it is not expedient or possible for them to be repaired, they will sign the Report of Survey to this effect.

In shore establishments, the original copy of the Report of Survey should immediately be forwarded to the Medical Director-General for his approval of the recommendations for disposal. The second copy should accompany the closed store accounts when they are forwarded to the Medical Director-General, and the third copy is retained with the copies of the closed store accounts—which it is wise to keep, in order that any subsequent queries concerning the account can be answered.

When afloat, the Report of Survey should be sent to the Commanding Officer for approval, instead of to the Medical Director-General. Otherwise the procedure is the same, Form M.176 being used instead of Form M.8.

Unserviceable stores are not to be disposed of until approval to do so has been received, either from the Medical Director-General or the Commanding Officer. As previously stated, such stores must be accounted for in the unserviceable sections of the account until disposed of.

Should *no* transactions have occurred in any section of the account from the date of the last survey, a **Certificate of Survey, Form M.231,** may be sent

to the Admiralty in lieu of the sections concerned, which need not be closed, nor a new section opened. Accounts which have been opened for the first time should never be regarded as having had no transactions.

REPAIRS

When articles require repair, approval must be obtained from the Medical Director-General on **Form M.58.** Such articles, however, may be sent to the Technical Assistant to the Medical Director-General for repair in anticipation of approval, but when it is proposed to forward articles to any other source, prior approval is necessary. Articles forwarded for repair to the Technical Assistant should be issued on Form S.549, but no transaction need be shown in the account. However, a copy of the issue voucher should be kept for reference until the return of the article, when the voucher may be destroyed.

LOOSE-LEAF LEDGER SYSTEM

The second method of accounting for dental stores is known as the loose-leaf ledger system, and is similar to the central store keeping system used for other naval stores.

Two ledgers are kept, a larger one for permanent stores, and a smaller one for expendible stores. Both ledgers consist of stout green covers with an attachment for taking the loose leaves, which are inserted in the covers. The larger cover for the *permanent* stores is known as **Form S.154,** the loose leaves for which are **Forms S.153.** The smaller cover for the *expendible* stores is known as **Form S.155,** for which the loose leaves are **Forms M.23** (used in lieu of **Forms S.151**).

Each item of stores is accounted for on a separate page. The pages are placed in the same consecutive order as that in which the items appear in the official Schedule of Equipment and Stores. Each page is given a consecutive number, running throughout both permanent and consumable accounts, so that no two items in either account possess the same page number. If more than one page is required for any item it must bear the same number, but be differentiated by the addition of a further number, thus 1/1, 1/2, 1/3, etc. Should it be necessary to include any page respecting an item for which no provision has previously been made between two consecutive numbers, the number of the previous page should be used with the addition of a letter "a," "b," "c," "d," etc.

The name and description of each article is written at the top of each page, and the ledger page number in the top right-hand corner. Underneath are a series of vertical columns headed "Date," "Voucher No.," "Received," "Issued" and "Remains," in which are inserted all transactions undertaken in respect of the article to which the page refers. Thus, information in respect of each issue or receipt voucher concerning the article is entered in these columns as follows—the date of the voucher, the number of the voucher (if *odd* it will indicate an issue voucher, and if *even* a receipt voucher), the number of articles received or issued, and in the last column the quantity remaining on charge as the result of the transaction. Each succeeding transaction is entered immediately underneath the previous one.

The pages referring to permanent stores, Form S.153, have columns on the right-hand side in which are entered transactions in respect of articles issued on **permanent loan.** Thus in a large dental department the permanent stores issued to each surgery can, if required, be accounted for in this way as being issued on permanet loan. In this case the surgeries concerned would account for them also, using **Form S.1099** for this purpose as an account, and **Forms M.60** as receipt vouchers for articles received from the main store, and **Forms M.61** as return vouchers for articles returned to the main store as surplus to requirements or as unserviceable.

Expendible stores, of course, cannot be issued on permanent loan.

In the loose-leaf ledger system it is necessary every six months to prepare a statement of the quantity of consumable stores expended in rendering dental treatment. Such a statement is known as an **abstract,** and is prepared on **Form M.147 (small)** in duplicate. It is, in fact, an issue voucher, and is given an appropriate issue voucher number. One copy must be sent to the Medical Director-General, and the other is retained with the other issue vouchers of the account.

Should any breakages occur during the six monthly period of articles having no salvage value—*i.e.* glass or porcelain articles—a list of such articles is similarly prepared in duplicate as an issue voucher, but on **Form M.149.** One copy is sent to the Medical Director-General, and the other is kept as an issue voucher to the account.

If neither Form M.147 or M.149 is available, Form S.549 may be used in lieu.

It is necessary, of course, to enter the quantities shown in these abstracts in the appropriate page of the ledger against the items concerned as issued.

Should any stores be lost or broken by negligence, they should be shown on Form M.151, which should be used as a supporting issue voucher to the ledger.

At least every other year it is essential that the quantities of stores remaining in custody should be checked with the quantities shown as remaining in the account. A space is provided on the back of each ledger page for the initials of the person responsible for mustering the stores, and for the date on which the muster took place. If discrepancies, whether surpluses or deficiences, are shown as a result of this muster, they must be reported to the Medical Director-General on **Form D.176,** with a statement as to their cause. In the event of any large discrepancies, proposals for preventing recurrence should be made. If it is impracticable to muster all the stores together, a few items should be mustered at a time as convenient, until the muster has been completed. In this case the muster should be completed within three months.

On the transfer of the stores from one officer to another, the incoming officer must muster the stores and ascertain that the quantities shown in the account correspond with those actually held. This muster must be undertaken within a period of three months, and a statement forwarded to the Medical Director-General that this has been done, together with a report of any discrepancies that have been discovered.

Surveys of unserviceable stores are held as required, and not at fixed intervals

as for accounts kept in Forms M.230A, B, C and D. The procedure for the actual survey remains the same. When approval for their disposal has been received from the Medical Director-General, stores condemned by survey as unserviceable are returned with an issue voucher to an R.N. Medical Depot, and accounted for accordingly.

The accounts are required for examination at the Admiralty from time to time, or alternatively a representative is sent to examine the accounts in the establishment. On these occasions all vouchers, issue and receipt, are examined and finally disposed of by the examining authority.

DEMANDS

Demands for stores are rendered half-yearly on **Form M.58** in duplicate, and at home are submitted for approval to the Medical Director-General through the Command Staff, or Fleet Dental Surgeon. On foreign stations, demands are submitted in duplicate to the Fleet or Senior Dental Surgeon for approval, who forwards them to the local Superintending or Senior Pharmacist for supply. If the necessity arises for an occasional demand, it should be submitted in the same way, but on **Form S.549.** Occasional demands, however, should be made in exceptional circumstances only.

Demands for stores are invariably to be compiled in accordance with the official **Schedule of Dental Equipment and Stores.** This Schedule, which is a list of stores available for issue, is divided into seven sections as follows :—

Section A ... Dental Surgery Equipment and Apparatus,

Section B ... Dental Instruments and Appliances,

Section C ... Dental Surgery Consumable Materials,

Section D ... Drugs and Medicaments,

Section E ... Dental Laboratory Equipment and Tools,

Section F ... Dental Laboratory Consumable Materials,

Section G ... Books, Forms and Stationery.

Items in the schedule are fully described, and are listed in alphabetical order under each section. Each item is allotted a **schedule number,** and when several patterns of an instrument or appliance are made, the **manufacturer's figure number** is quoted also.

In order to enable the particular items demanded to be identified, it is essential that a full description of each article should be given. It is important for this reason to quote the schedule number, and where applicable the manufacturer's figure number also. If this information is not given either the supply will not be made at all, or else an article of the wrong pattern may be issued in the absence of more detailed information, involving in either case unnecessary correspondence. Obviously it is impossible for those concerned to supply the article required, unless a full description is given on the demand. The description " Excavators double ended " or " Probes various " is insufficient.

The following examples illustrate where accuracy in description is necessary :—

Mounts for Syringe—The manufacturer and pattern number should be stated, *i.e.*, whether D.M.Co. or A.D.Co., and whether " A," " B," "A.K," " B.K," etc.

Needles for Syringe—The length required should be stated.

Electrical Equipment—The voltage, and whether the current is A/C or D/C must invariably be stated.

Cylinders of Nitrous Oxide—It should be stated whether a vertical or horizontal pattern is required, and the capacity given.

Burs—In addition to the pattern, it should be stated whether they are required for No. 2 or No. 7 handpiece, and the size required in accordance with the schedule should be given. The quantity required should be made clear, and should be stated in packets and not in numbers.

Demands on Form M.58. In compiling Form M.58, articles should be listed alphabetically under sections, in the same order as that in which they appear in the official Schedule, and the description of each item should correspond to that given, which is normally sufficient.

In addition to the quantities demanded, the information required under the various columns must invariably be given—namely, serviceable and unserviceable quantities remaining on charge, quantities expended in the previous six months, etc.

It if is considered necessary to demand stores not shown in the official Schedule, they should be listed separately, and the reasons for the demand of these particular items given in full.

Demands on Form S.549. When making occasional demands on Form S.549, it should be remembered that this form is designed for use either as a demand, receipt or supply note, and the purpose for which it is used must be made clear by striking out the wording which does not apply. Consequently when the form is used as a demand, all reference to receipt and supply, or receiving and supplying, must be deleted, and the form must be stamped and signed in the correct place consistent with it being a demand. Failure to do so will lead to confusion, and may have unfortunate consequences. No action will be taken on a demand incorrectly made out, if the authority concerned assumes it is an issue note, and consequently awaits the *arrival* of stores.

Demands, whether on Forms M.58 or S.549, should be compiled neatly and clearly, so that there is no mistake as to the originator's meaning. The dental surgery attendant should not scrawl on Form S.549 in pencil. If it is not possible to use a typewriter, he should write legibly in ink.

Articles demanded on Form S.549 should be listed in the same way as on Form M.58, using the same sequence and description. Columns where appropriate should be completed.

Demands for Artificial Teeth. When it is desired to replenish stocks of artificial teeth, the manufacturers' printed forms are used. These forms can be obtained direct from the manufacturers, or on application to the Medical Director-General, and are designed as shown below :—

SHADES

Moulds	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	etc.	Total

Artificial teeth have a mould number and a shade number. The *mould* numbers of the teeth required are entered in the left-hand column of the form. In the numbered columns indicating the *shade* numbers, are inserted the *quantity* of teeth required under the appropriate columns. Demands made on these forms should accompany Forms M.58 or S.549.

CONSIGNMENT OF STORES

When demanding packing cases to pack up stores for transit, full details of requirements should always be given. The make of the dental chair and other heavy equipment, the dimensions of instrument cabinets, the approximate quantity and weight of consumable stores for which the cases are required should be stated. A demand stating " Please send sufficient packing cases to return dental equipment to store " is insufficient.

Much trouble is often caused at R.N. Medical Depots when cases of stores are received, through insufficient care on the part of the sender or consignor. The following instructions should be observed :—

The stores should be packed carefully in strong packing cases.

A **Packing Note, Form D.71** (or S.549 in lieu), should be inserted in each case giving details of the contents, and a duplicate copy sent by mail to the receiver or consignee. It is important that the reference number of the Packing Note should be clearly marked on the outside of the packing case. This helps the R.N. Medical Depot to verify the consignor and the nature of the contents. The return of the Issue Voucher to clear the dental store account will accordingly be expedited. The reference number should be quoted on all vouchers and correspondence relating to the particular consignment.

When consigning stores by rail a **Consignment Note** should be completed.

Form D.80 is used if stores are sent by goods train, and **Form D.80P** if they are sent by passenger train. The instructions in the top left-hand corner are to be carried out and six copies of the form are necessary ; one to be retained for reference, one to be sent by mail to the consignee, one as a pass for the

Police at the dockyard gate, and the other three copies for the Railway Company. The "Carriage Vote" to be quoted is 3K.

On paying off at home, dental equipment and stores are normally returned to the Technical Assistant to the Medical Director-General, except opened consumable stores, which should be returned to the Fleet or Command Dental Surgeon, and unopened drugs, which should be sent to the Superintending or Senior Pharmacist of the nearest R.N. Hospital. On paying off abroad, dental stores should be returned to the nearest Superintending or Senior Pharmacist, or as the Fleet or Senior Dental Surgeon directs.

CHAPTER 18

DANGEROUS DRUGS

POISONS must be contained in blue-ribbed bottles, clearly marked and labelled, so that they may be readily distinguished from others by sight and feel. Yellow labels should be used. Poisons must be kept in a locked cupboard, the key of which is retained in the possession of the dental officer or, out of working hours, kept on the ship's keyboard and logged in the sentry's book.

In large dental departments, when a bottle containing a dangerous drug is removed from the store cupboard, **Requisition Form M.236** is to be prepared in duplicate, and signed by both the issuing and receiving dental officers. The duplicate Form M.236 should accompany the dental store account as a voucher to issue when the account is closed and forwarded to the Medical Director-General. The original Form M.236 is retained in the establishment for two years.

Quantities used on individual patients are to be recorded on **Form M.238** in shore establishments, and on **Form M.177** afloat, and also on Form M.228. In R.N. Hospitals and R.M. Infirmaries, quantities used on in-patients are entered on **M.40 H.S.,** as well as on Form M.228. Form M.238 is to be preserved for not less than two years from the date of last entry thereon.

CHAPTER 19

SERVICE COMMUNICATIONS

REFERENCE SHEET.—Written communications between one naval authority and another are usually made on a reference sheet. The form of the communication differs from that used in private or business letters, and the commencement "Dear Sir," and the ending "Yours faithfully" are never used. The communication is formal and not personal. At the top of the page is shown *from whom* it is sent, *to whom* it is addressed, and the *date* and a *reference number* are given. Underneath is written the *heading*, indicating briefly the subject matter, and below this the *text*, or subject, which should give briefly and concisely in an impersonal form the information, etc., it is desired to convey. The sender's *signature* is appended below the text, followed by his *rank and office*.

An example of such a communication is given below.

From :— The Senior Dental Surgeon, H.M.S. EXAMPLE.

To :— The Command Dental Surgeon, R.N. Barracks, Home Port.

Date :— 1st January, 1948. Reference No. D 5/1.

DENTAL STORES

The attached half-yearly demand for dental stores is submitted. It is requested that it may be forwarded to the Medical Director-General for approval.

A. SMITH,

Surgeon Lieutenant Commander (D) R.N.,
Senior Dental Surgeon.

A junior officer always submits any proposals or information to a senior officer. This is indicated by commencing the text of the communication with the word "submitted," or else by including the word in the text, as shown in the example above.

Minutes.—A communication may become the subject of a series of "minutes," written by various authorities to whom the communication is passed for remarks. Such minutes are dated and given a reference number, and headed "Minute I," "Minute II," etc. The signature of the originator, and the name of the authority to whom it is forwarded is given, and the minutes may be written on the original communication, or be attached.

Service Channels.—Confusion sometimes arises as to the correct service channels through which a communication should be passed. Communications from one head of a department to another within a ship or establishment are sent direct. The dental officer is head of his own department. Any communications, except those of a purely routine nature, sent to authorities outside the

ship or establishment, must be forwarded through the Commanding Officer. Communications intended for the Medical Director-General should be forwarded through the Commanding Officer to the Command, Staff, or Fleet Dental Surgeon for onward transmission. Where it is desired to raise matters affecting policy, the communication should be sent to the Commanding Officer who will, if he considers it necessary, forward it to the Commander-in-Chief, adding his remarks and observations. If necessary, the Commander-in-Chief will forward it to the Secretary of the Admiralty with his observations, if the matter requires Admiralty decision.

Records.—A record should be kept in a Register of all incoming and outgoing correspondence. Each communication sent from the dental department should be given a reference number.

Service Letter.—When an officer wishes to represent a *personal* matter officially to a senior officer—for example when acknowledging an appointment, or making an official request concerning his employment or conditions of service—he writes a formal service letter commencing :—

" Sir,
I have the honour to submit . . ."

and ends :—

" I have the honour to be,
Sir,
Your obedient servant,
. . . . "

A letter of this type is not used by an officer writing in his official capacity as a dental officer. In such a case the impersonal form of communication previously described is used.

Signals.—Communications by signal are dealt with on page 85. A dental officer may make routine signals concerning dental matters in the name of the Commanding Officer and with his concurrence, but not on matters affecting policy.

CHAPTER 20

SUMMARY OF CLERICAL DUTIES

A SUMMARY of the principal clerical duties of a dental surgery attendant is given below. He will :—

Daily :

1. Keep the dental officer's Appointment Diary, and ensure that patients are given clear notice of the times of their appointments ;
2. Prepare Dental Treatment Form M.228 with full particulars respecting each patient attending for the first time ;
3. Prepare Form M.234, if treatment includes the supply, etc., of dentures ;
4. Keep the Statistical Return, Form M.235, up to date ;
5. Keep a record in the Diary, Form S.1, of the number of operations performed, carrying forward the totals each day, so that at the end of the month information is available for the preparation of Form M.235c—Monthly Return of Dental Operations.
6. Enter any storekeeping transactions in the Dental Store Accounts, M.230A, B, C and D, or Loose-Leaf Ledger, and ensure that invoices are signed and returned without delay ;
7. Keep a Register of incoming and outgoing correspondence ;
8. Record expenditure (if any) of Dangerous Drugs on Form M.238 ;

Monthly :

1. Prepare and forward Form M.235c, Monthly Return of Dental Operations ;
2. Forward Form M.240, Monthly Return of Laboratory Appliance Work ;
3. Prepare in duplicate, and forward to the Medical Director-General, monthly Nominal Lists of members of Allied and Commonwealth Forces who have received dental treatment. This return should show against each name the nationality of each patient, and the cost of dental treatment received in accordance with the Admiralty Scale of Fees as shown in current Admiralty Fleet Orders. Relevant Forms M.228 should accompany the return ;
4. Render any returns required by Local Orders ;
5. Forward completed Forms M.228 to the appropriate filing centres ;

Half-Yearly

1. Forward the Half-Yearly Dental Report by the Dental Officer ;
2. Forward the Half-Yearly Demand for Dental Stores on Form M.58 ;

Annually :

1. Forward Annual Statistical Return of Dental Operations, Form M.235 ;
2. Forward Report of Survey, Forms M.8 or M.176, if a survey of dental stores has been held.

CHAPTER 21

SUMMARY OF DENTAL FORMS AND THEIR USES

(a) Treatment

M.227a **Dental History Envelope.**—Used for containing records of dental treatment on Forms M.228 and M.234. It shows on the outside the dental condition of the patient on entry, and is issued at the patient's training establishment. Subsequently it is retained at the patient's filing centre as shown in current Admiralty Fleet Orders. When the patient is discharged from the Service, his dental records contained in this envelope are forwarded to the Medical Director-General.

M.228 **Dental Treatment Form.**—Used for recording dental treatment for every class of patient, including Army, Air Force, Commonwealth and Allied personnel, and miscellaneous patients. Completed forms are transmitted monthly to the appropriate filing centres.

M.229 **Dental Appliance Card.**—Used for recording appliance work undertaken for individual patients. It is completed in the dental laboratory, and shows expenditure of appliance materials. Form M.240—Monthly Return of Appliance Work—is completed from information contained on Forms M.229.

M.233 **Dental Appointment Card.**—Given to the patient as an authority and a reminder to attend the dental department at the time and date stated thereon.

M.234 **Supply of Dentures.**—An application form, and subsequently an authority, for the supply, replacement or repair of dentures, either at the public expense or on repayment. In the latter case, the form is used to recover the necessary cost of the dentures from the patient's pay. The form also accompanies the models, etc., and records the dates of their transmission between the dental surgeon fitting the dentures and the dental surgeon in charge of the dental laboratory, and enables these two officers to exchange any remarks concerning the construction, etc., of the dentures.

M.239 **Certificate of Supply of Dentures.**—This form is attached to the patient's Pay and Identity Book, and is a certificate (*a*) that dentures have been recommended, and (*b*) that they have been fitted. It also records each stage in the construction of the dentures.

S.1 **Appointment Diary.**—This is a general diary in book form, containing ruled pages for each day, interspersed with blank pages for notes. For recording dental appointments.

M.201 **List of Patients sent for Dental Examination or Treatment.**—This form is issued in ships or establishments in which no dental surgeon is borne, when patients are referred elsewhere for dental treatment. The dental surgeon undertaking treatment briefly indicates details of treatment on the form, and states the times and dates of next appointments. The form is returned to the patients' Medical Officer, or (if none is borne) to the Commanding Officer.

S.31 **Dental Treatment.**—This form is used in respect of naval personnel eligible to receive dental treatment at the public expense, who are sent to a civilian dental surgeon, when Navy, Army, or Air Force facilities are unobtainable. The form is issued by the patient's Commanding Officer, and the dental surgeon is requested to undertake emergency treatment only, and to indicate on the form any further treatment required, together with an estimate of the cost in accordance with the Admiralty Scale of Fees. The form is sent to the appropriate Command Dental Surgeon for his approval before further treatment is undertaken. When treatment is completed, the dental surgeon submits his account on the form, and after approval has been received from the Command Dental Surgeon, financial settlement is made by the appropriate Supply Officer. The bottom of the form is used for recording treatment given, and this portion is subsequently detached, and forwarded to the patient's filing centre for inclusion with existing dental records.

(b) Returns and Reports

M.235 **Annual Statistical Return of Dental Operations.**—Covers for.

M.235a **Annual Statistical Return of Dental Operations.**—Loose leaves for. This return is a nominal list of patients seen throughout the year by an individual dental surgeon, and gives details of the operations performed.

M.235c **Monthly Return of Dental Operations.**—This monthly return gives less detailed information of the operations performed than Form M.235, and is not a nominal list.

M.240 **Monthly Return of Dental Appliance Work.**—This form is compiled from information entered on Forms M.229.

S.425 (5a) **Report of Inspection.**—This form is completed by the Command, Staff, or Fleet Dental Surgeon on the Commander-in-Chief's Staff, subsequent to the inspection of a dental department.

(c) Store Accountancy, Supplies and Demands

M.230 A, B, C and D. **Account of Dental Equipment and Stores.**—Used for accounting dental stores where the Loose-Leaf Ledger System is not employed. **Section A** accounts for Dental Surgery Equipment, **Section B** for Dental Laboratory Equipment, Tools, and Consumable Laboratory Stores, **Section C** for Dental Instruments, and **Section D** for Dental Consumable Materials.

M.231 **Certificate of Survey.**—Used to certify that no transactions have taken place in the store accounts, or section of the accounts, on Forms M.230, from the date of opening the accounts to the time that they would normally have been closed. When a certificate is furnished on this form, the existing account or section is not closed.

M.8 **Report of Survey.**—An account and certificate of stores condemned by survey, used in shore establishments.

M.176 **Report of Survey.**—An account and certificate of stores condemned by survey, used afloat.

M.189 **Stores claimed as Lost or Broken.**—A certificate for accounting for stores lost or broken by accident, and used as an issue voucher to the Dental Store Account.

M.151 **Stores Lost or Broken by Negligence.**—A certificate for accounting for stores lost or broken by negligence and charged against the offender. Used as an issue voucher to the Dental Store Account.

M.58 **Demand for Surgical Instruments or Dental Stores.**—Used for making half-yearly demands for dental equipment and stores.

S.549 **Demand, Supply or Receipt Note.**—This form can be used either as a demand for *occasional* supplies, or for the purpose of transferring stores. In the latter case it will be used either as an issue or receipt voucher to the store account, as the case may be.

D.55 **Contractors Invoice.**—This invoice will be received from contractors who supply stores as a result of an Admiralty order. One half should be signed and returned to the contractor, and the other half retained as a receipt voucher to the Dental Store Account.

S.153 **Pages of Loose-Leaf Ledger—Permanent Store Account.**

S.154 **Covers for Loose-Leaf Ledger—Permanent Store Account.**

M.23 **Pages for Loose-Leaf Ledger—Consumable Store Account** (used in lieu of S.151).

S.155 **Covers for Loose-Leaf Ledger—Consumable Store Account.**

M.147 (Small) **Abstract of Issues.**—Used for accounting expenditure of stores, and as an issue voucher to the Loose-Leaf Ledger Store Accounts (Form S.549 can be used in lieu).

M.149 **Abstract of Breakages of China and Glass.**—Used to account for breakages of china and glass when the Loose-Leaf Ledger Store Accounts are used, and as an issue voucher (Form S.549 can be used in lieu).

D.176 **Report of Stocktaking.**—Used to report discrepancies discovered on mustering stores when the Loose-Leaf Ledger Store Accounts are used.

S.1099 **Account of Stores on Permanent Loan.**—Used for accounting stores issued on permanent loan in connection with the Loose-Leaf Ledger Store Accounts.

M.60 **Issue Voucher for Stores on Permanent Loan.**—Used as an issue voucher for stores on permanent loan and accounted for on Form S.1099.

M.61 **Return Voucher for Stores on Permanent Loan.**—Used as a return voucher for stores issued on permanent loan and accounted for on Form S.1099.

D.71 **Packing Note.**—Used to list articles packed for transit to another authority. One copy is inserted in the packing, and the other forwarded by post to the consignee.

D.80
D.80P } **Consignment Note.**—Used when stores are consigned by rail to another authority, Form D.80 being used when they are sent by goods train, and Form D.80P when sent by passenger train. Six copies are necessary. One is retained for reference, one is sent by mail to the consignee, one is used as a pass for the Police at the Dockyard Gate, and the other three copies are for the Railway Company. The carriage vote to be quoted is 3K.

M.236 **Requisition Form for Dangerous Drugs.**—Used when dangerous drugs are issued from the main store. It is signed both by the person receiving, and the person issuing the drugs.

M.238 **Record of Supplies to Individual Patients of Dangerous Drugs.**—A record of the expenditure of dangerous drugs on individual patients. Used in shore establishments.

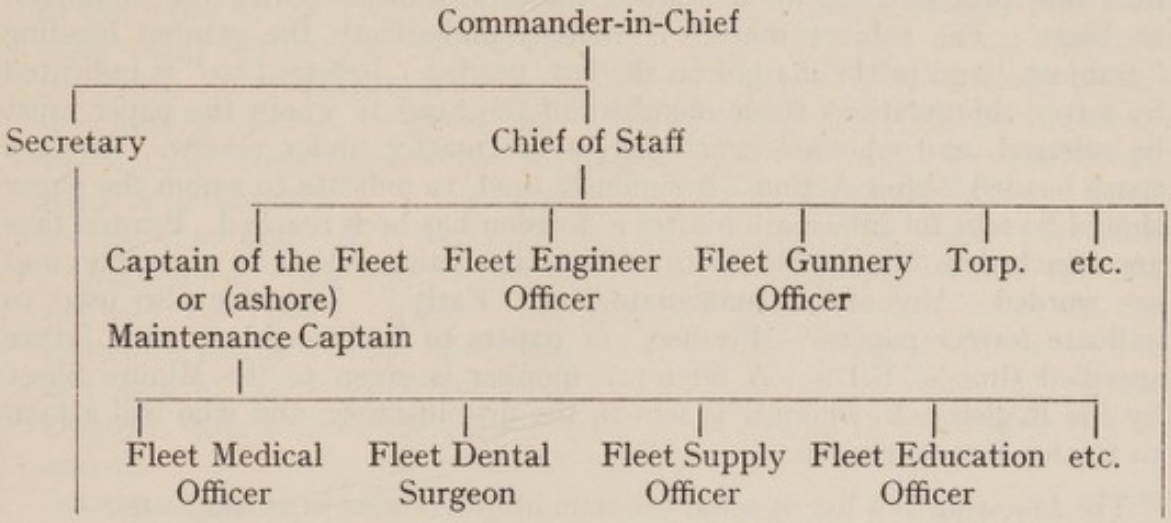
M.177a **Record of Supplies of Dangerous Drugs.**—A record of the expenditure of dangerous drugs on individual patients. Used afloat.

CHAPTER 22

DUTIES WITH A COMMAND, STAFF OR FLEET DENTAL SURGEON

WHEN a dental surgery attendant is serving personally with a Command, Staff, or Fleet Dental Surgeon, it will be necessary for him to acquire some knowledge of administration.

Command and Fleet Dental Surgeons are appointed on the Staffs of the Commanders-in-Chief. As staff officers it is their duty to advise the Commanders-in-Chief on all dental matters affecting the Commands or Fleets. Dental matters are usually related to questions of Personnel and Material. The following chart indicates the organization of a Commander-in-Chief's staff, which in war-time may be further sub-divided in some sections :—



Assistant-Secretary

Secretaries to :—
- Chief of Staff
- Captain of Fleet

Officers of the Secretariat :—
- Personnel (P1 and P2)
- Material (M1 and M2)
- Orders (O)
- The Registry
- Typists, Writers, etc.

Staff Officers,
- Operations
- Plans
- Movements
- Intelligence,
- etc.

The Command, Staff, or Fleet Dental Surgeon is responsible for scrutinizing all dental reports, returns, and demands for dental stores, from dental officers in the Command or Fleet. Such information is normally received in duplicate, and together with any other information received in respect of dental matters within the Command or Fleet, is filed in the Command, Staff or Fleet Dental Surgeon's office. It is the responsibility of the dental surgery attendant to attend to this filing, and to ensure that each document is available for immediate reference.

In certain commands, the Command Dental Surgeon is in charge of a filing centre for dental records on Forms M.228 and M.234, which are contained in the dental envelopes Forms M.227a. It is the responsibility of the dental surgery attendant to keep this file in order and up to date, so that the records of any particular patient are immediately available for reference as required.

It is essential that Command, Staff, and Fleet Dental Surgeons should retain records of all current Admiralty Fleet Orders, Command or Fleet General Orders and Temporary Memoranda, Medical Director-General's Memoranda, etc., affecting dental matters. The dental surgery attendant should ensure that such information is filed, and is available for immediate reference when required.

Communications

Official communications may be effected by Staff Minute Sheet, by ordinary Reference Sheet, or by Signal, according to circumstances.

Staff Minute Sheets are used by members of an Admiral's staff for initiating proposals, or for discussing matters connected with the Command or Fleet. The subject matter is written underneath the printed heading "Subject," and in the margin on the left, headed "Referred to," is indicated by letter abbreviations those members of the Staff to whom the paper must be referred, and who are concerned in the matter under review. Another space headed "After Action" is similarly used, to indicate to whom the paper should be sent for information after a decision has been reached. Printed tags are attached to Minute Sheets to indicate hastening action, if necessary, and are worded "Urgent," "Immediate," or "Early." Tags are also used to indicate former papers—"Former," or papers to be brought up at a future specified time—"B/U." A reference number is given to the Minute Sheet by the Registry, to whom it is sent in the first instance, and who will attach to it any former papers.

The following is a list of some common abbreviations in current use :—

MEMBERS OF THE STAFF

C.O.S.	...	Chief of Staff.
C.O.F.	...	Captain of the Fleet.
M.C.	...	Maintenance Captain.
Sec.	...	Admiral's Secretary.
A/Sec.	...	Assistant Secretary.
F.M.O.	...	Fleet Medical Officer.
F.D.S.	...	Fleet Dental Surgeon.
F.E.O.	...	Fleet Engineer Officer.
F.G.O.	...	Fleet Gunnery Officer.
F.T.O.	...	Fleet Torpedo Officer.
F.N.C.	...	Fleet Naval Constructor.
S.O.O.	...	Staff Officer Operations.
S.O.P.	...	Staff Officer Plans.
S.O.M.	...	Staff Officer Movements (of ships).
S.O.S/M.	...	Staff Officer Submarines.
S.O.L.C.	...	Staff Officer Landing Craft.
S.O.M/S.	...	Staff Officer Minesweeping.

P.1 and P.2 Secretariat Officers for Personnel Matters.
M.1 and M.2 Secretariat Officers for Material Matters.
F/Ap.O. ... Fleet Appointments Officer.

ON A MINUTE SHEET

P.S.A. ... Proposed Signal Attached.
P.N.F.A. ... Proposed No Further Action.
Formers ... Former correspondence on a subject.
B/U. ... Bring Up (again at some specified time).

Reference or Communication Sheets.—Ordinary methods of communication on Reference or Communication sheets are used when dealing with matters that do not require discussion by the Commander-in-Chief's Staff, or where urgency does not necessitate a Signal. See page 75.

Signals are a convenient and quick method of communication, where urgency is a consideration and brevity can be used. The Command, Staff or Fleet Dental Surgeon in his capacity as such, is empowered to make signals of a purely departmental nature relating to dental matters on his own authority, in the name of the Commander-in-Chief, but any dental matters which may effect other branches of the Service must be referred first to the Captain of the Fleet. When a signal is made, not only the name of the authority to whom it is addressed must be given, but it must also be addressed for information to all those authorities whom the matter may concern. The classification must be given—either " Unclassified," " Urgent," " Important," or " Secret," as the case may be. Normally dental matters come under the heading " Unclassified." Paragraphs in the text should be numbered. At the end of the text, the Time of Origin of the Signal is given. If the text of the signal relates to matters which have been referred to in previous signals, the Time of Origin of the former signals must be quoted for reference. The Time of Origin is indicated by a series of numbers, the first two relating to the date, and the next four to the time, using the twenty-four hours system. At the bottom of the signal the internal distribution for the information of members of the Staff is given. The Command, Staff, or Fleet Dental Surgeon should be included to ensure that he receives a copy.

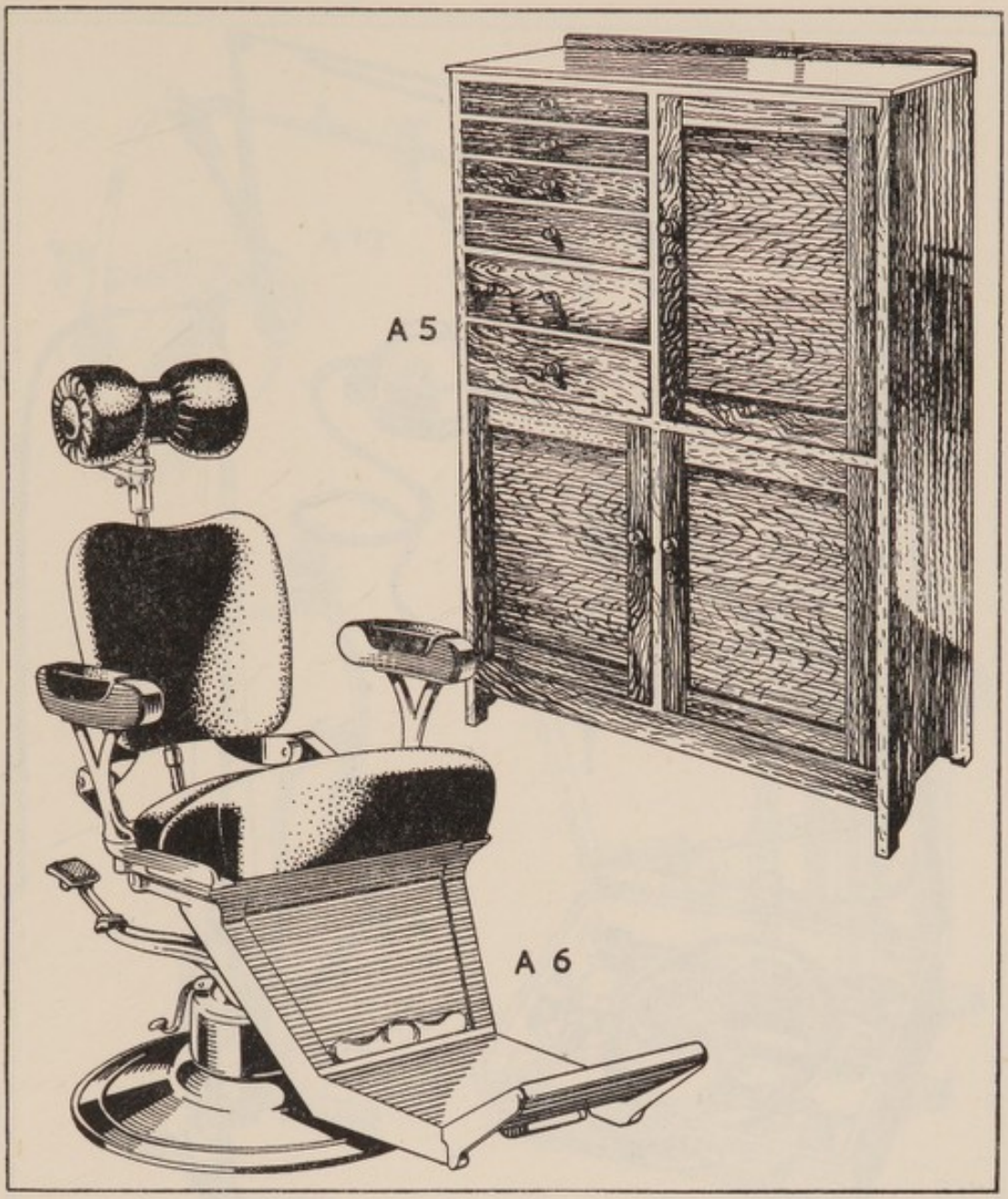
In conclusion, the dental surgery attendant, attached for duty to a Command, Staff or Fleet Dental Surgeon, must remember that such duties involve much of a strictly confidential nature, and that he must be worthy of, and not abuse, the trust and confidence placed in him.

APPENDIX

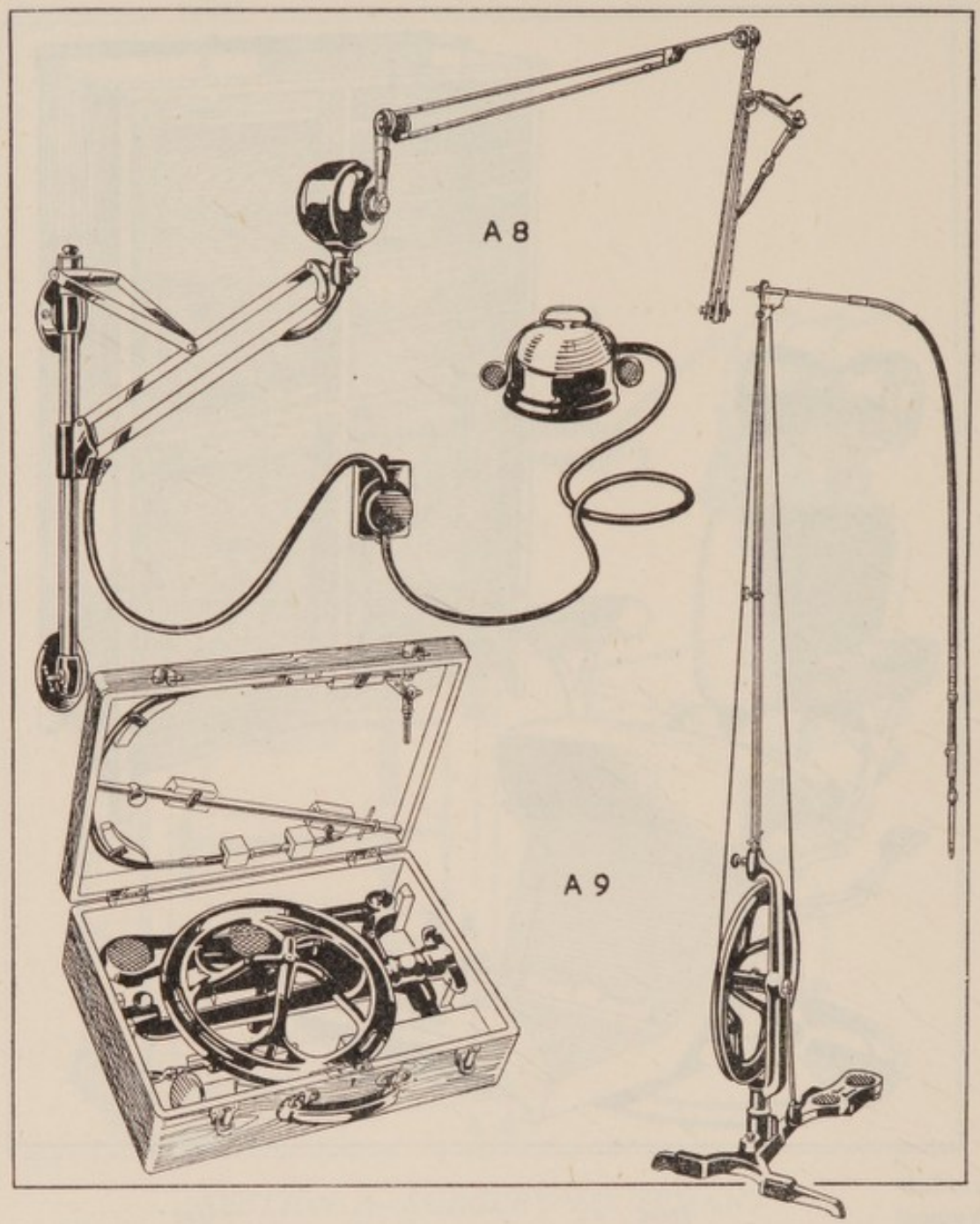
LIST OF DENTAL EQUIPMENT AND STORES

SECTION A—SURGERY EQUIPMENT

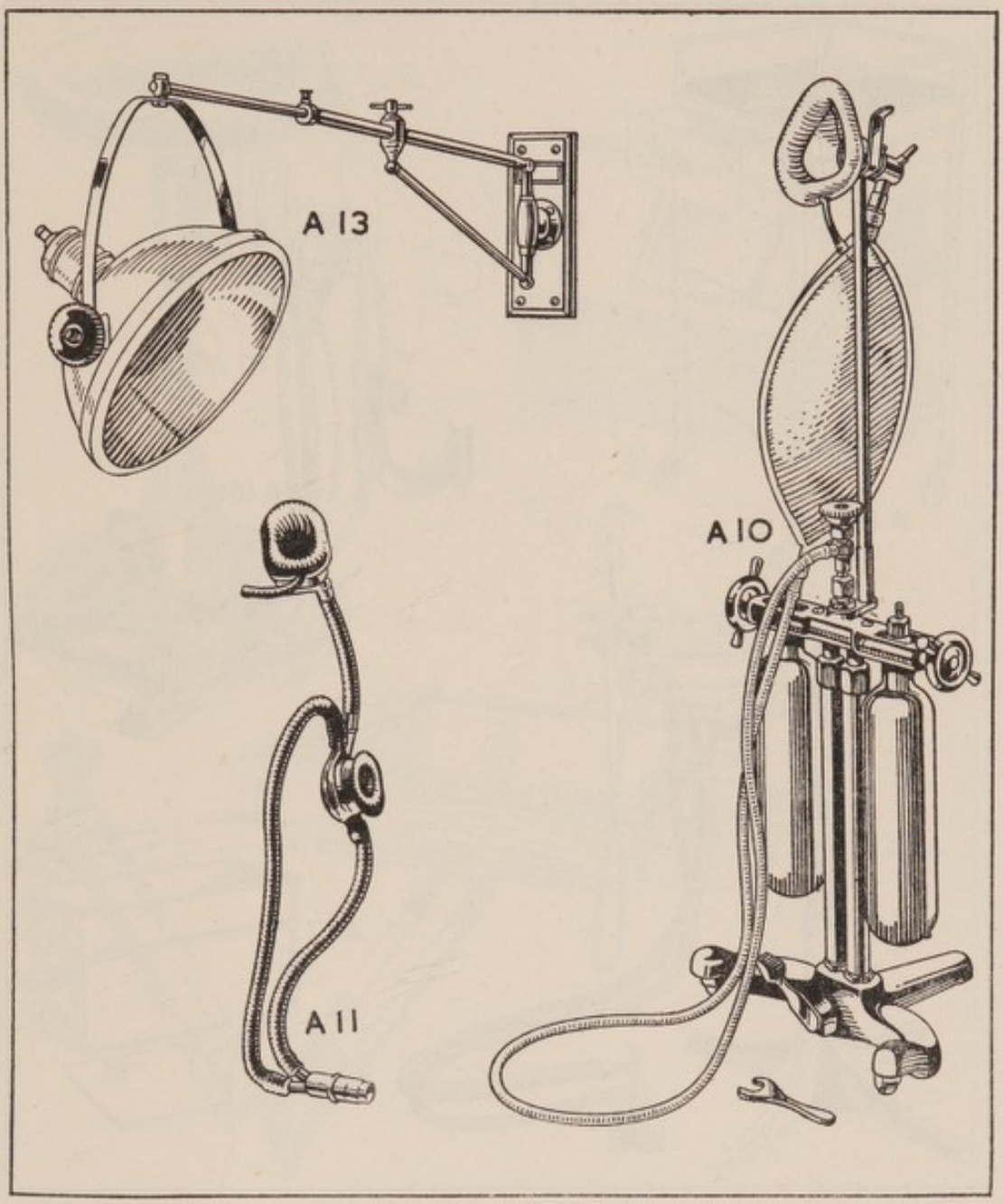
Schedule Number	*Item*	*Use*
A1	ATOMIZER OUTFIT, Complete Comprising : (*a*) Atomizers, three in number (*b*) Tumbler, Glass (*c*) Heater, Electric, for Atomizers and Tumbler (*d*) Cylinder, Compressed Air, Complete, with Tubing and Cut-off Nozzle (*e*) Pump, Foot, Complete	For vaporizing antiseptic fluids, used for irrigating and cleansing purposes.
A2	Box for Napkins, Glass	



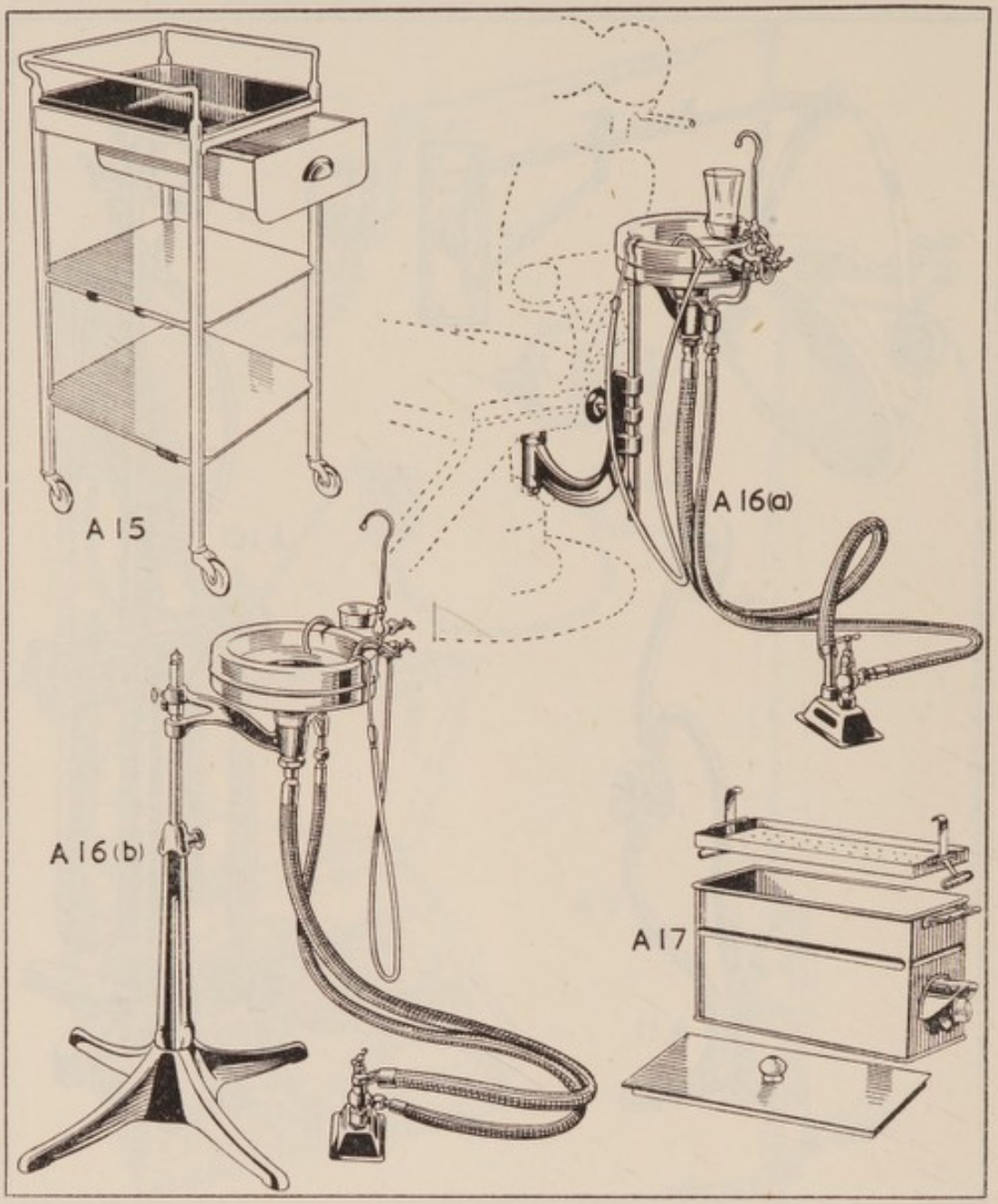
Schedule Number	*Item*	*Use*
A3	Box for Wool Rolls, Glass	
A4	CABINET, Aseptic, Enamelled Metal and Glass	A metal and glass cabinet, with glass shelves, for keeping instruments.
A5	CABINET, Dental, Wooden	A large wooden cabinet, with numerous drawers, for keeping instruments, appliances, etc.
A6	CHAIR, Dental Pump	Operating dental chair.



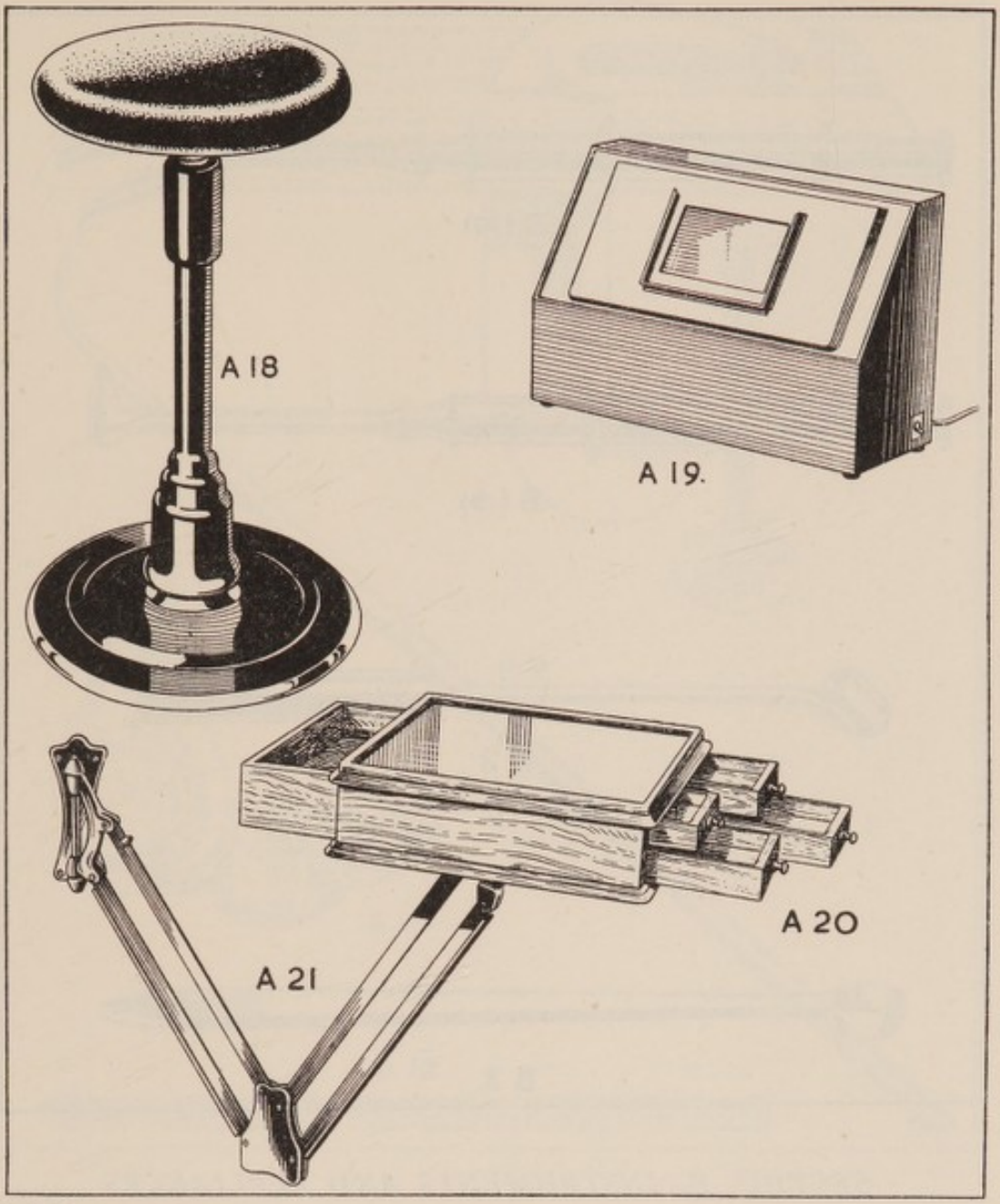
Schedule Number	*Item*	*Use*
A7	CHAIR MAT, Rubber	A three-quarter circular spongy rubber mat, encircling the dental chair.
A8	ENGINE, Electric (Voltage to be stated)	For operating burs, drills, stones and brushes.
A9	ENGINE, Foot, Portable, in Wooden Travelling Case	For use where electricity is not available, or in emergency. Worked with the foot.
A10	GAS APPARATUS, Complete Comprising : (*a*) Stand (*b*) Gas Bag, with Tubing I.R.	For administering nitrous oxide anaesthesia.



Schedule Number	*Item*	*Use*
A10	GAS APPARATUS (*contd.*) (*c*) Bag Mount (*d*) Stop Cock, 3-Way (*e*) Facepieces, Medium and Large (2) (*f*) Cylinder Key (*g*) Gas Cylinders, 100 galls. (4) (*vide* C.1.)	
A11	GAS APPARATUS, NASAL INHALER	An attachment for use in prolonged nitrous oxide anaesthesia.
A12	KETTLE, Electric	For supplying hot water.
A13	LAMP, Electric, Shadowless (also Spare Glass for)	An operating light, sited over the dental chair.



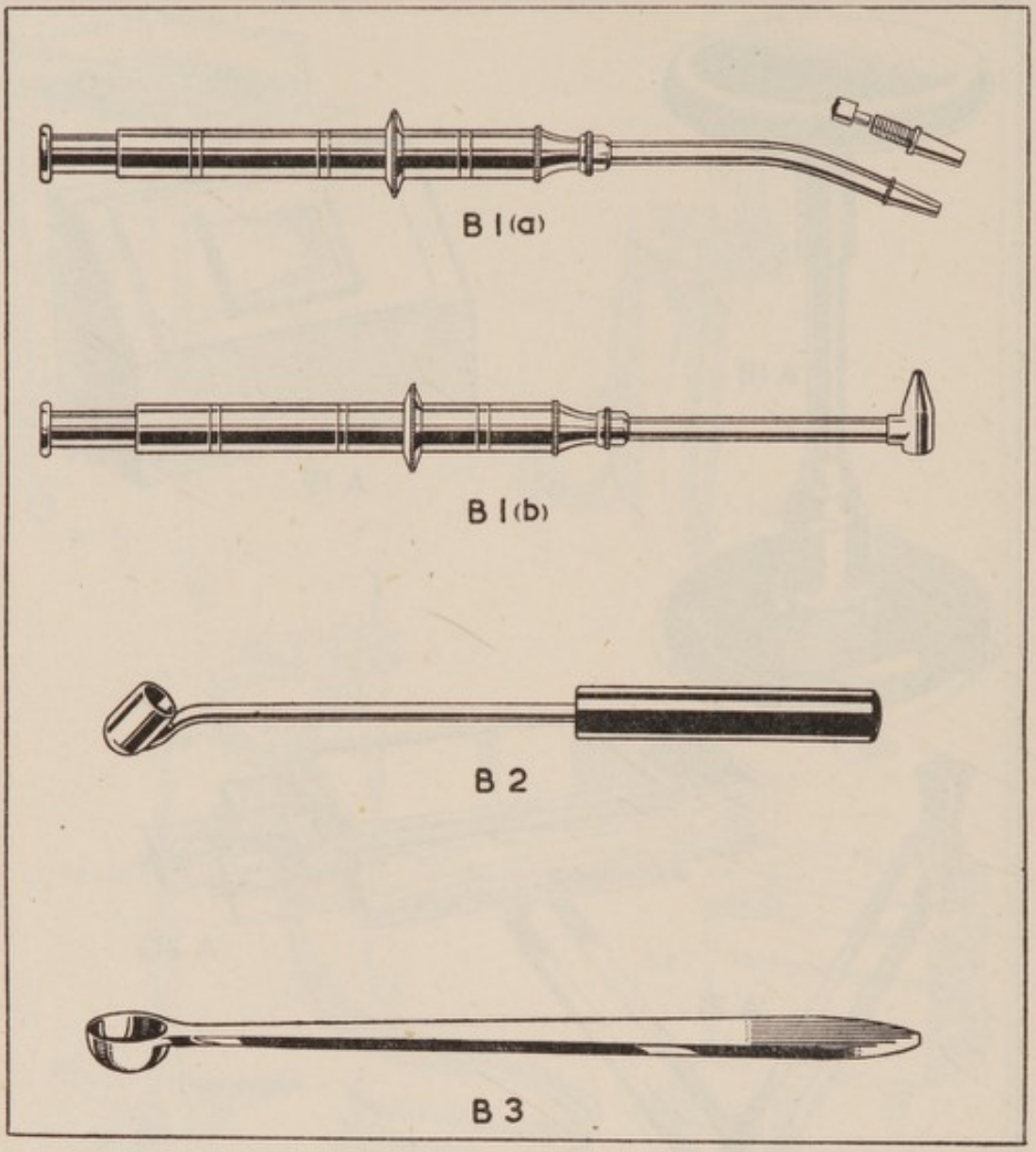
Schedule Number	*Item*	*Use*
A14	LAMP, Electric, Anglepoise	Similar to an adjustable reading lamp—for attachment to the dental chair.
A15	LOCKER, Bedside (Admiralty pattern), also Top for, S/S and Plywood	A metal table, on which instruments and appliances for dental operations are laid out.
A16	SPITTOON, Fountain (*a*) Chair bracket type (*b*) Pedestal stand type	Fitted with water supply, saliva ejector and waste pipes. Sited on the left of the operating chair.
A17	STERILIZER, Electric	For sterilizing instruments and appliances by boiling.
A18	STOOL, Operating, Adjustable	
A19	VIEWING LANTERN, X-RAY	For viewing X-ray films.



Schedule Number	*Item*	*Use*
A20	TABLE, Bracket, Allen's type	A movable tray, with drawers underneath, for holding instruments.
A21	WALL BRACKET, Adjustable, for Bracket Table	An adjustable bracket, for carrying the bracket table.
A22	WASTE DRESSING BUCKET	For the disposal of soiled dressings, etc.

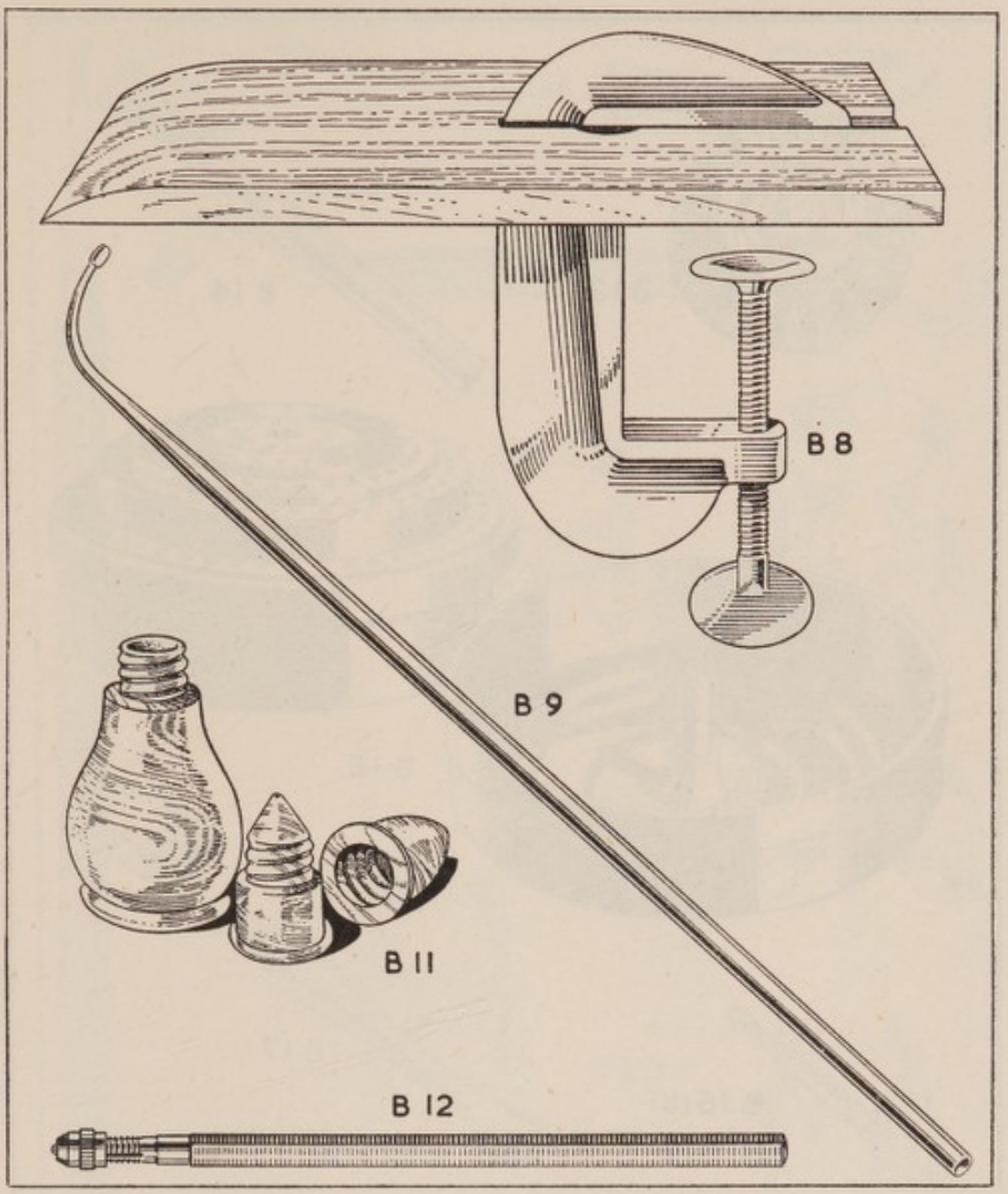
SUPPLEMENTARY LIST (Supplied to certain Centres only)

A23	DENTAL UNIT, " Rathbone," D.M.C.	Combined spittoon, engine, atomizer and lamp. Has additional accessories.
A24	X-RAY UNIT, " Sterling," A.D.C.	For taking X-ray photographs.

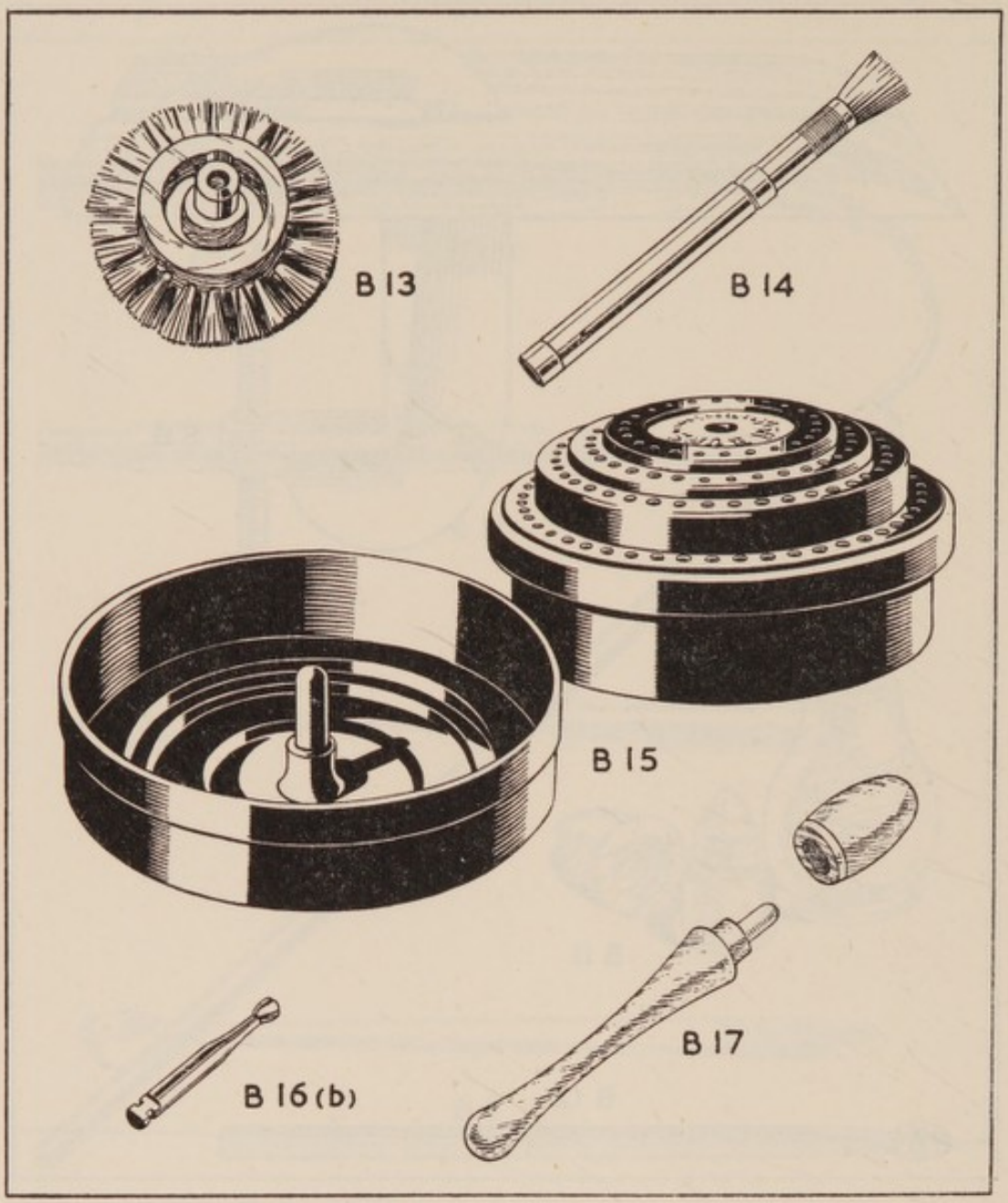


SECTION B—INSTRUMENTS AND APPLIANCES

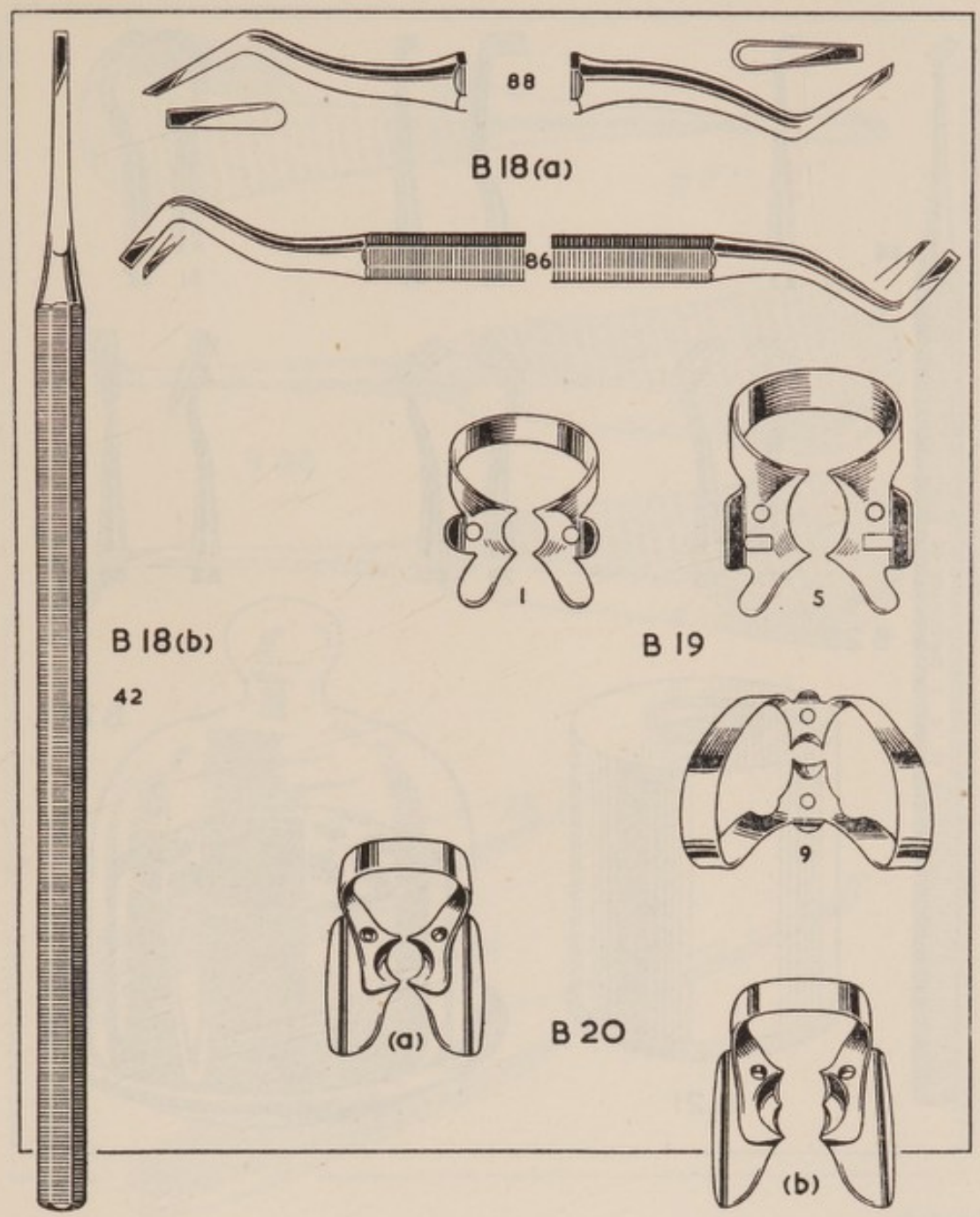
Schedule Number	*Item*	*Use*
B1	AMALGAM CARRIER : (*a*) Straight A.D.C.'s Fig. 5 (*b*) Right-angle A.D.C.'s Fig. 8	For conveying amalgam.
B2	AMALGAM MEASURE, Tulloch's	For measuring alloy.
B3	AMALGAM SPOON, A.D.C.'s Fig. 3	For heating ingots of copper amalgam.
B4	ARKANSAS STONE, 3½-in. × 1-in.	For sharpening instruments.
B5 (E4)	BASINS, Enamelled Iron, 7¾-in. dia. (N.V. Patt. 6a)	For heating impression materials, etc.



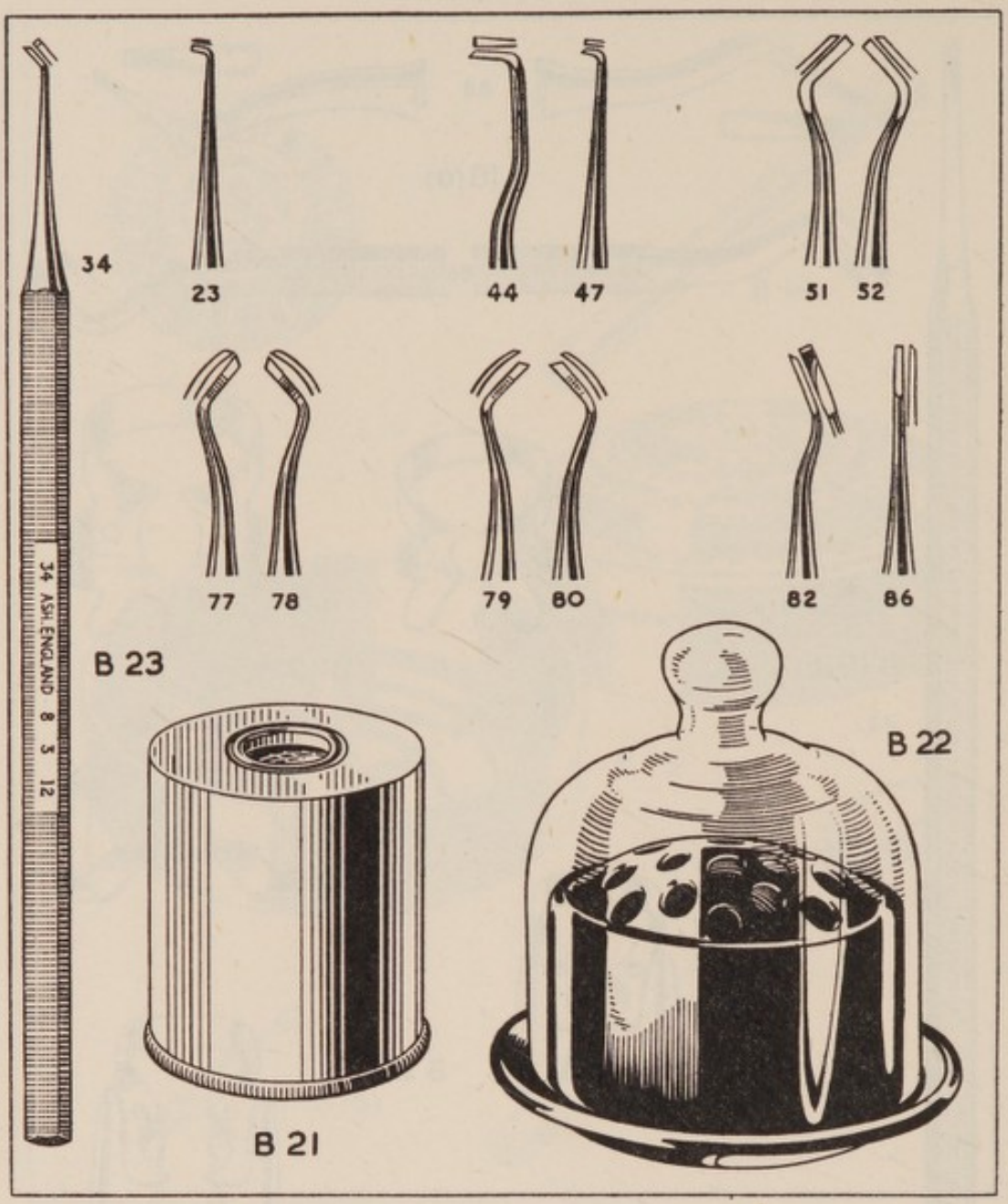
Schedule Number	*Item*	*Use*
B6	BASINS, Glass	For general use.
B7 (E4)	BASINS, Rubber, 4½-in. × 3½-in.	For mixing Plaster of Paris.
B8	BENCH PIN, with Metal Clamp	For filing dentures, etc., on.
B9 (E31)	BLOWPIPE, Mouth, 13-in.	For smoothing wax, and soldering, etc.
B10	BOTTLES, Medicament, 1 oz. Plain, D.M.C.	For containing drugs and medicaments.
B11	BOTTLE, Mercury, Boxwood, A.D.C.'s Fig. 1	For containing mercury.
B12	BROACH HOLDER, A.D.C.'s Fig. 4	For holding barbed and plain broaches, used in root-canal treatment.



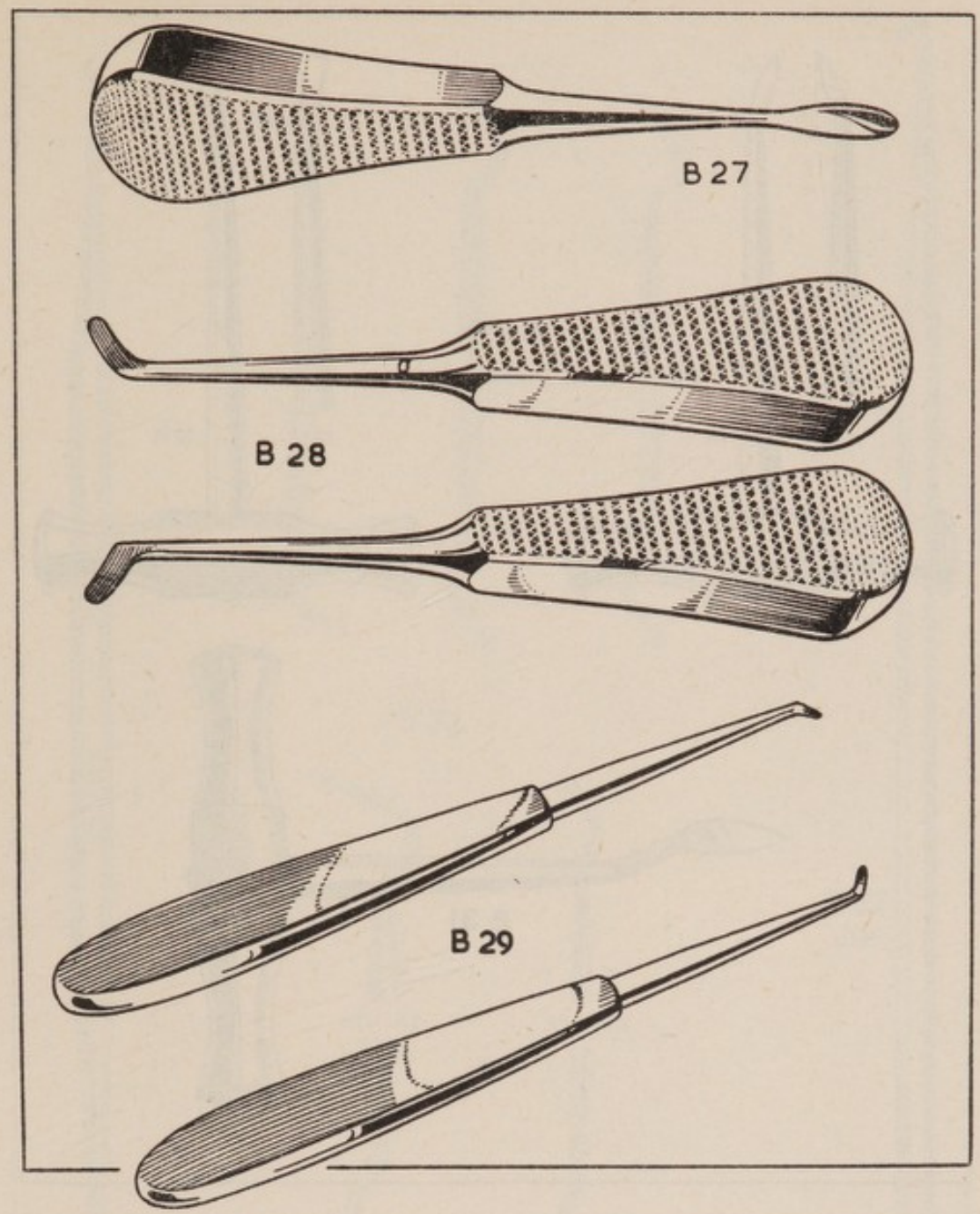
Schedule Number	*Item*	*Use*
B13	BUR BRUSH, with Hub, for Engine	For cleaning burs.
B14	BUR BRUSH, Hand, A.D.C.'s Fig. 3	For cleaning burs.
B15	BUR CONTAINER, D.M.C.'s No. 2	For containing burs.
B16	BURNISHERS, Engine (Pear G) : (*a*) for Straight Handpiece (*b*) for Right-Angle Handpiece	For burnishing fillings. (**NOT** consumable).
B17	CAUSTIC POINT HOLDER, Wooden	For holding pointed sticks of silver nitrate.
B18	CHISELS, ENAMEL : (*a*) Double Ended, A.D.C.'s Figs. 86, 88 (*b*) Single Ended, A.D.C.'s Fig. 42	For cutting dental tissue by hand in cavity preparation.



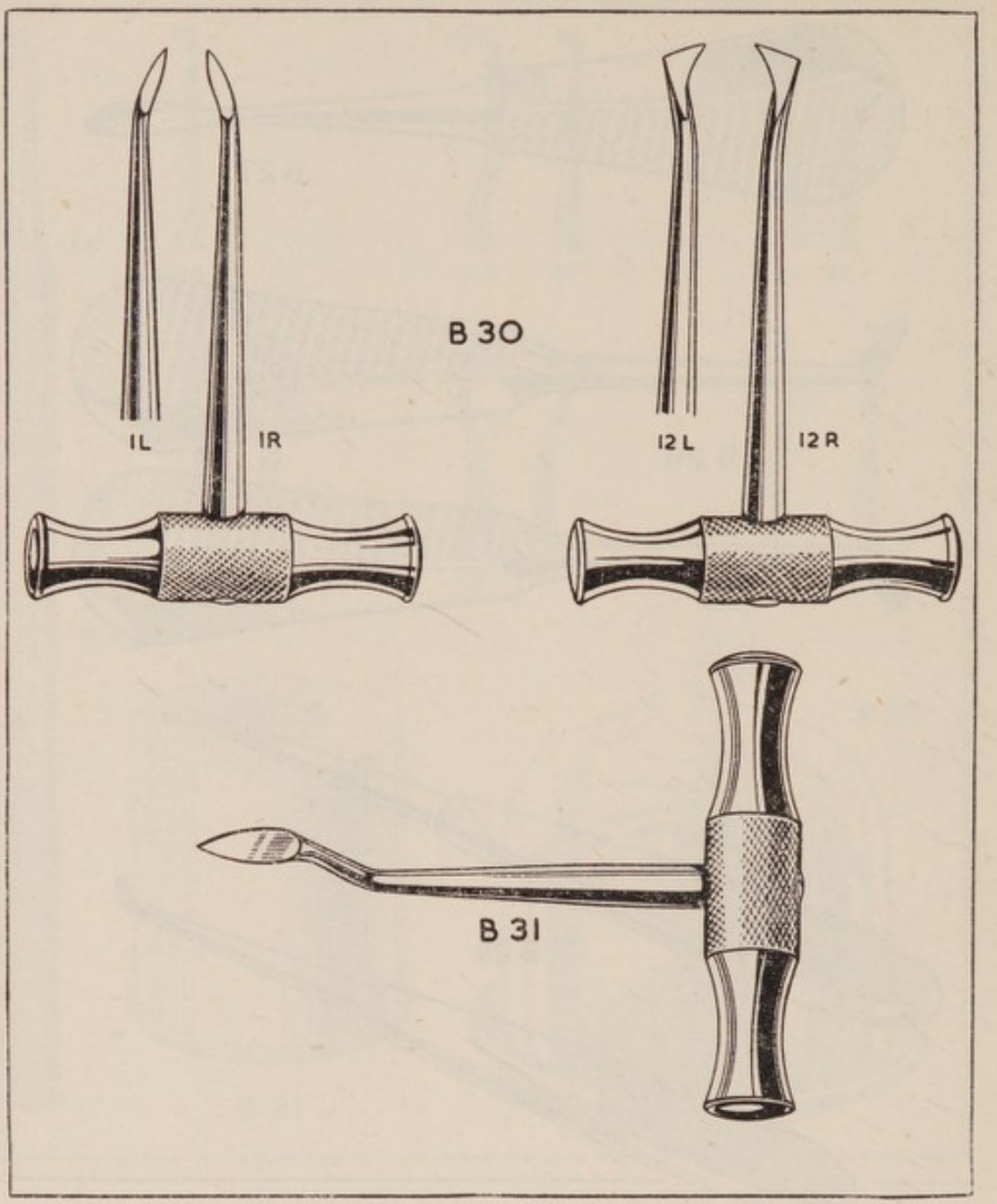
Schedule Number	*Item*	*Use*
B19	CLAMPS, Rubber Dam, Ivory's, A.D.C.'s Figs. 0, 1, 2a, 5, 7 and 9	Steel clamps, which fasten round the neck of the tooth, and are used to retain rubber dam sheet in place. The latter is used as a protection against moisture.
B20	CLAMPS, Wool Roll, Rogers' : (*a*) Bicuspid (*b*) Molar	Clamps, for retaining cotton wool rolls in place.



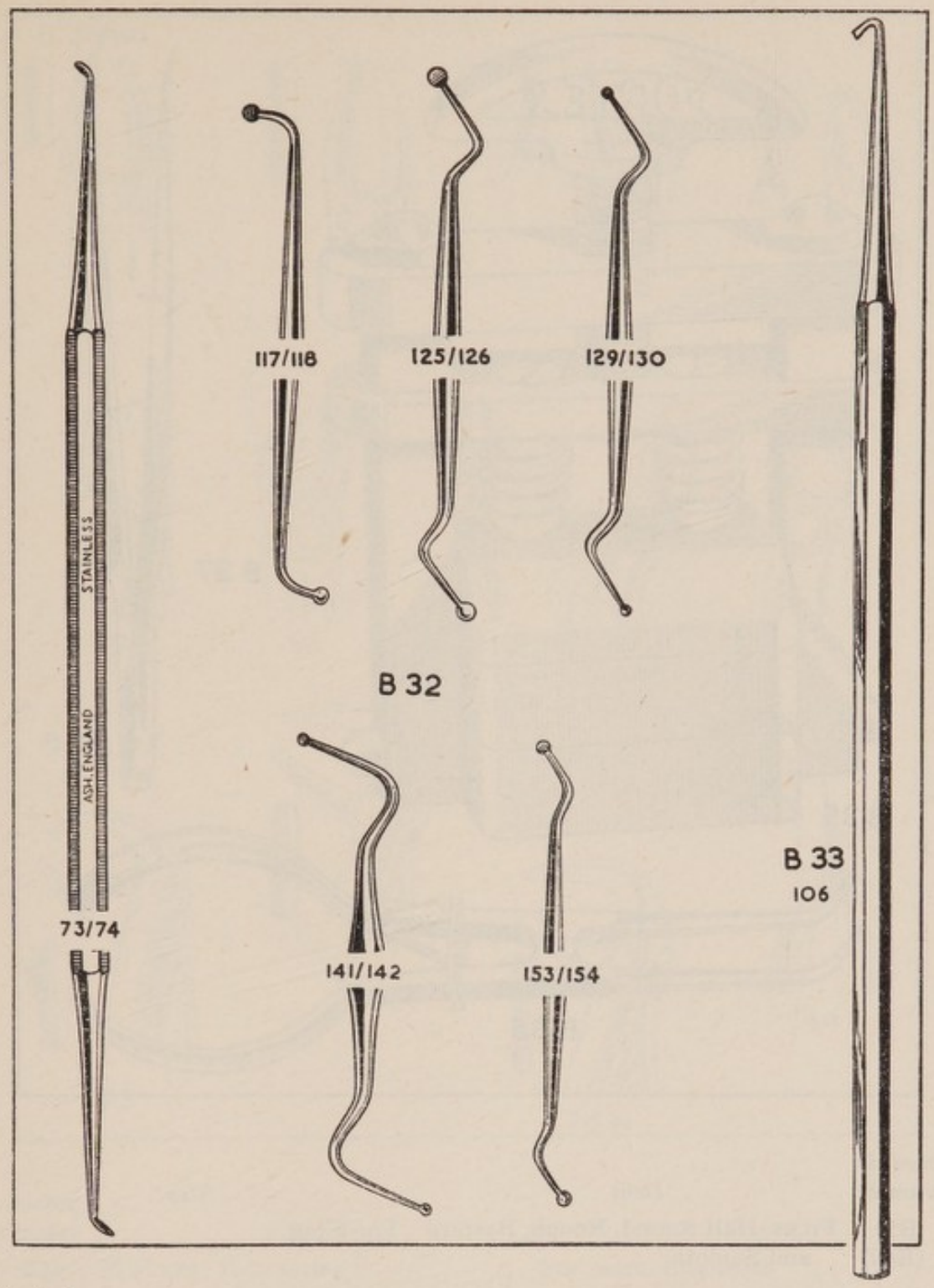
Schedule Number	*Item*	*Use*
B21	Cotton Wool Holder, A.D.C.'s Fig. 1	For holding cotton wool.
B22	Cotton Wool Pellet Holder (with glass cover)	For holding prepared cotton wool pellets.
B23	Cutting Instruments, Black's, A.D.C.'s Figs. 23, 34, 44, 47, 51, 52, 77, 78, 79, 80, 82, 86	For cutting dental tissues by hand in cavity preparation.
B24	Dishes, White Porcelain : D.M.C.'s Fig. C— $2\frac{3}{8}$-in. × $1\frac{1}{2}$-in. × $\frac{1}{2}$-in. D.M.C.'s Fig. D— $7\frac{1}{8}$-in. × $4\frac{1}{2}$-in. × $\frac{1}{2}$-in.	For containing instruments.



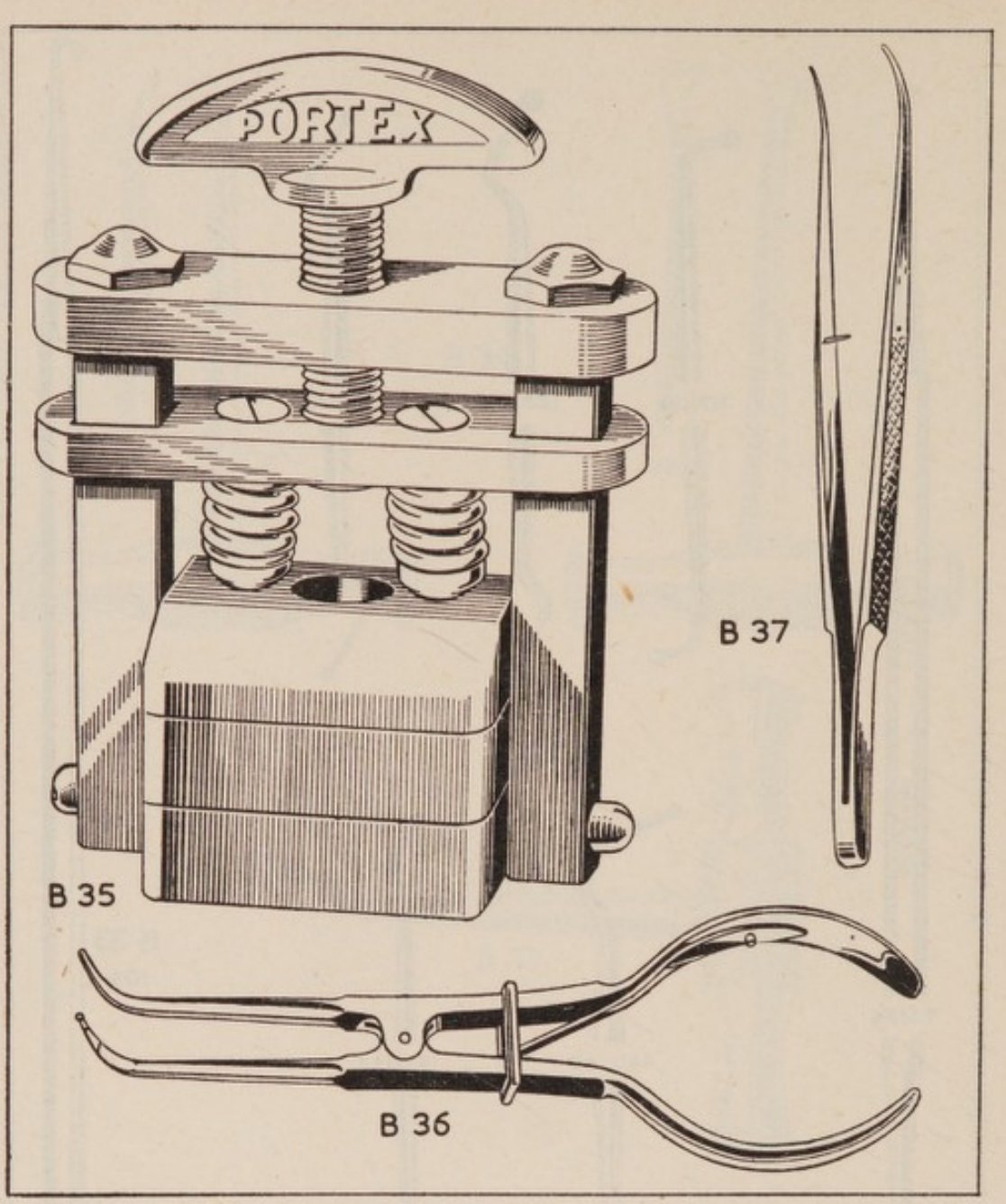
Schedule Number	*Item*	*Use*
B25	DISHES, Kidney, Stainless Steel (Patt. 511)	For placing under the patient's chin when syringing, etc.
B26	DISHES, Sterilizing, Enamelled Iron 10-in. × 8-in. (Patt. 976)	In which to sterilize instruments with antiseptic solutions.
B27	ELEVATOR, Straight, Read's, A.D.C.'s Fig. 19	For loosening a tooth in its socket, prior to extraction (see page 32).
B28	ELEVATORS, Hospital Pattern, Left and Right, A.D.C.'s Figs. 21 and 22	For removing separate roots, etc. (see page 31).
B29	ELEVATORS, Warwick James, Left and Right	For removing small buried teeth or fragments (see page 32).



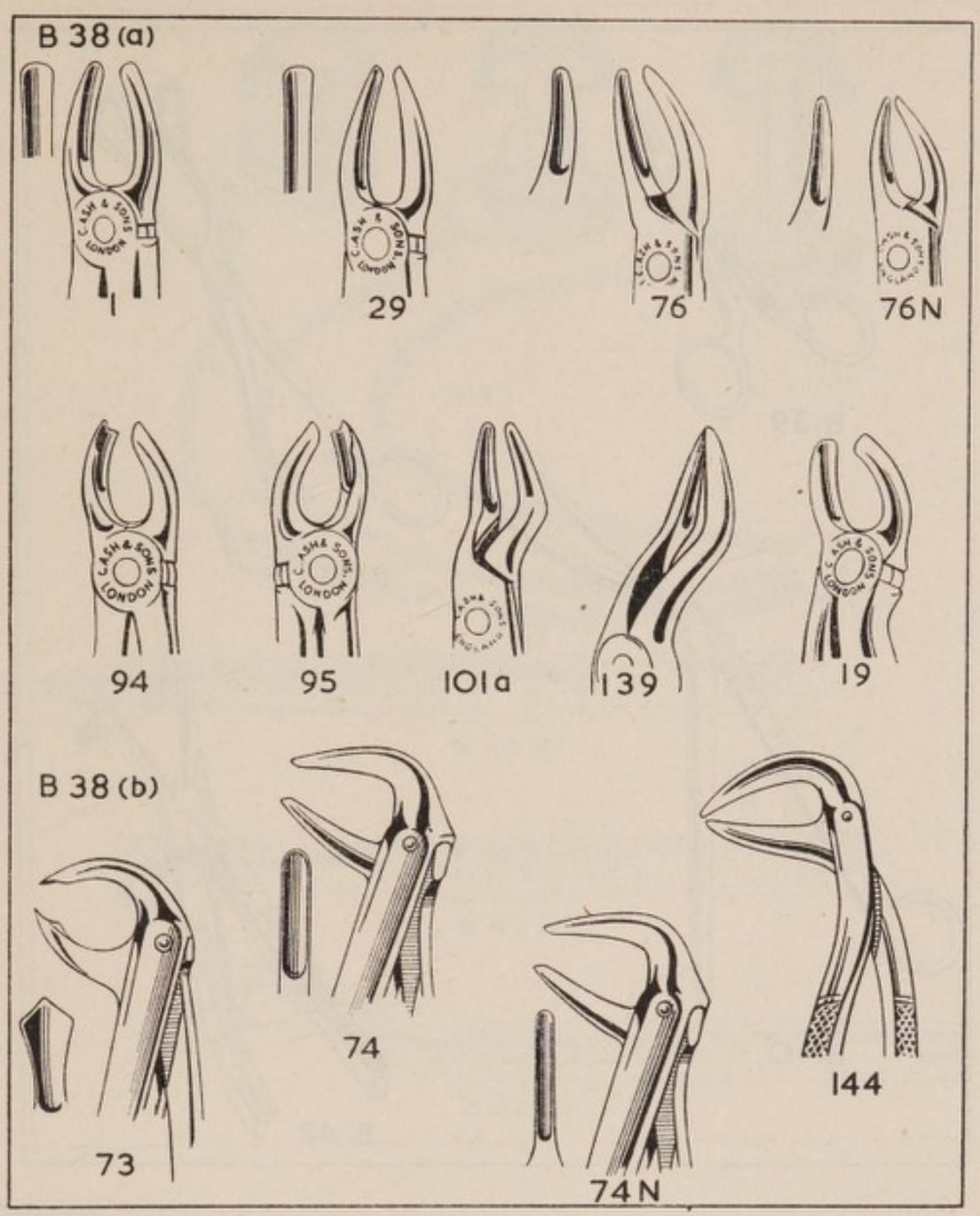
Schedule Number	*Item*	*Use*
B30	ELEVATORS, Winter's, Left and Right, two pairs, A.D.C.'s Figs. IL, IR and 12L, 12R	For removing teeth, and especially roots (see page 32).
B31	ELEVATOR, Le Cluse, A.D.C.'s Fig. 18	For removing teeth, especially the third mandibular molar (see page 32).



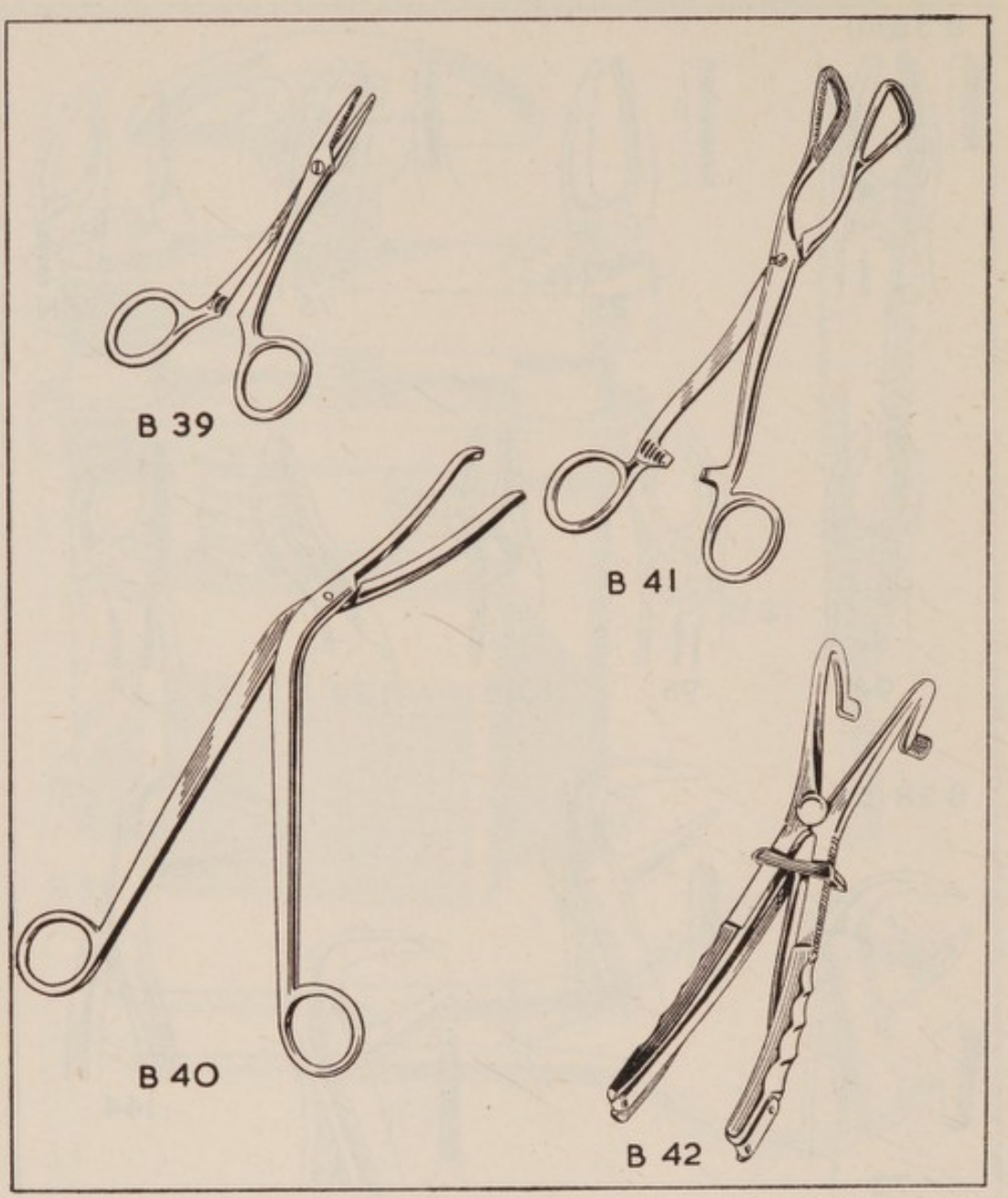
Schedule Number	*Item*	*Use*
B32	EXCAVATORS, Double Ended A.D.C.'s Figs. 73/74, 117/118, 125/126, 129/130, 141/142, 153/154	For removing caries.
B33	EXCAVATORS, Single Ended A.D.C.'s Fig. 106	For removing caries.



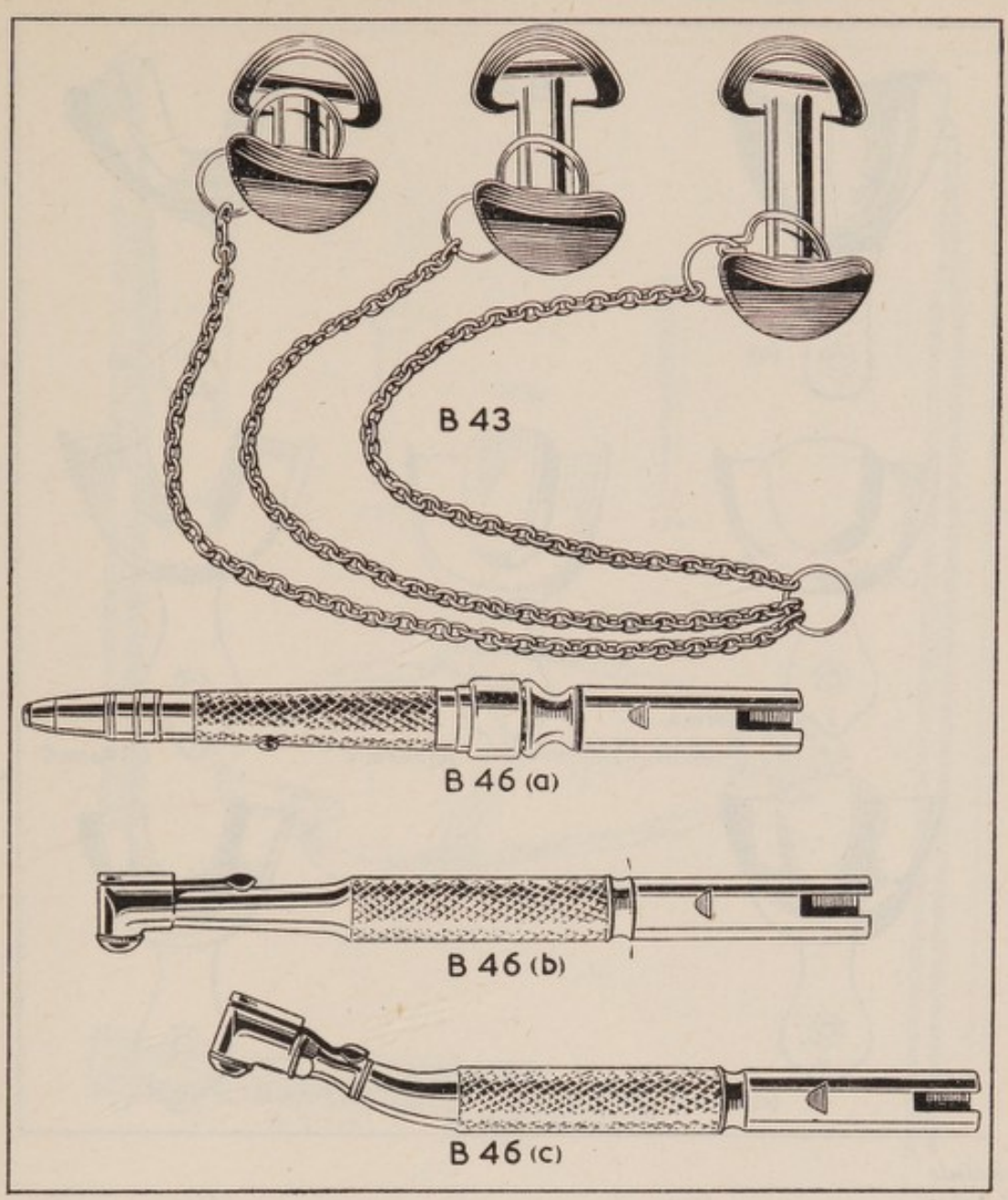
Schedule Number	*Item*	*Use*
B34 (E40)	FILES, Half Round, Rough, Bastard and Smooth	For filing.
B35	FLASKS, Swing Compress, Small	For processing acrylic teeth, crowns and inlays.
B36	FORCEPS, Clamp, Stokes'	For conveying clamps.
B37	FORCEPS, Conveying, A.D.C.'s Fig. 8	Tweezers, for conveying cotton wool, etc.



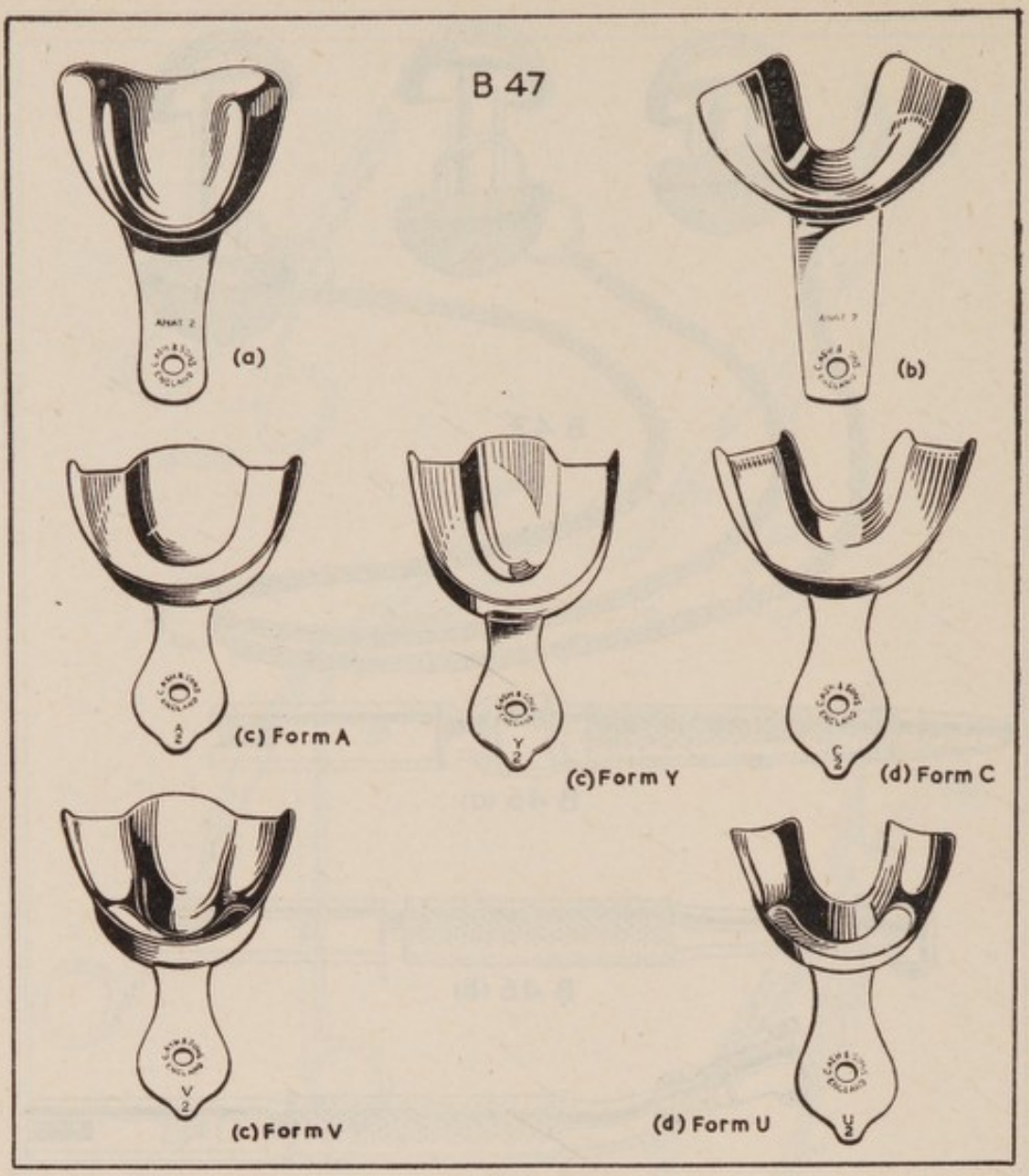
Schedule Number	*Item*	*Use*
B38	FORCEPS, Extracting :	For extracting teeth (see page 31).
	(*a*) for Upper Teeth, A.D.C.'s Figs. 1, 29, 76, 76N, 101A, 139, 94, 95, 19	
	(*b*) for Lower Teeth, A.D.C.'s Figs. 74, 74N, 73, 144	



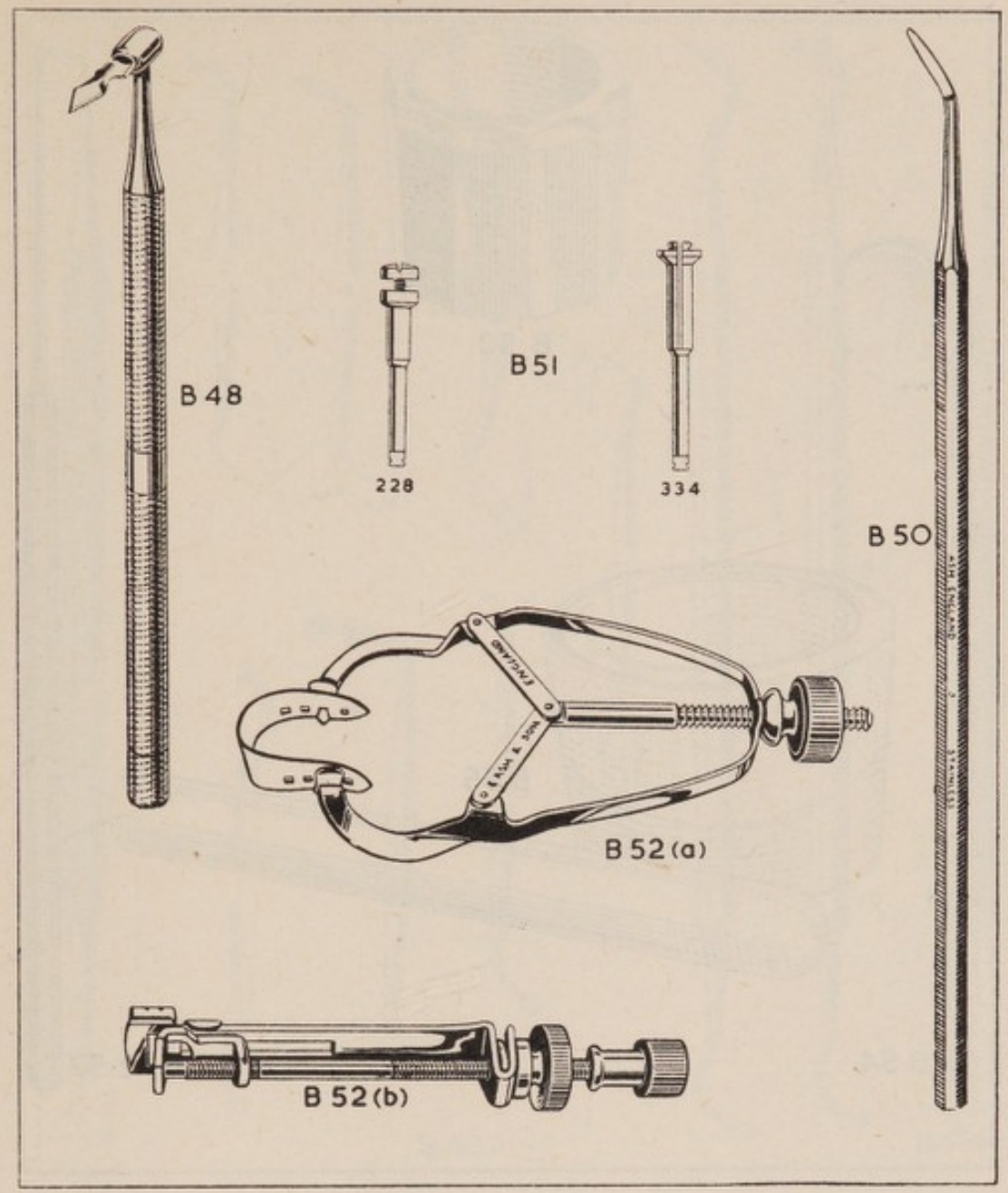
Schedule Number	*Item*	*Use*
B39	FORCEPS, Spencer-Wells (Patt. 625)	For grasping arteries, tags of gum, etc., and for holding suture needles.
B40	FORCEPS, Sterilizing, Cheatles's (Patt. 643)	For conveying articles to and from the sterilizer.
B41	FORCEPS, Tongue (Patt. 649)	For holding the tongue during anaesthesia.
B42	GAGS, Fergusson's	For opening and gagging the jaws during anaesthesia.



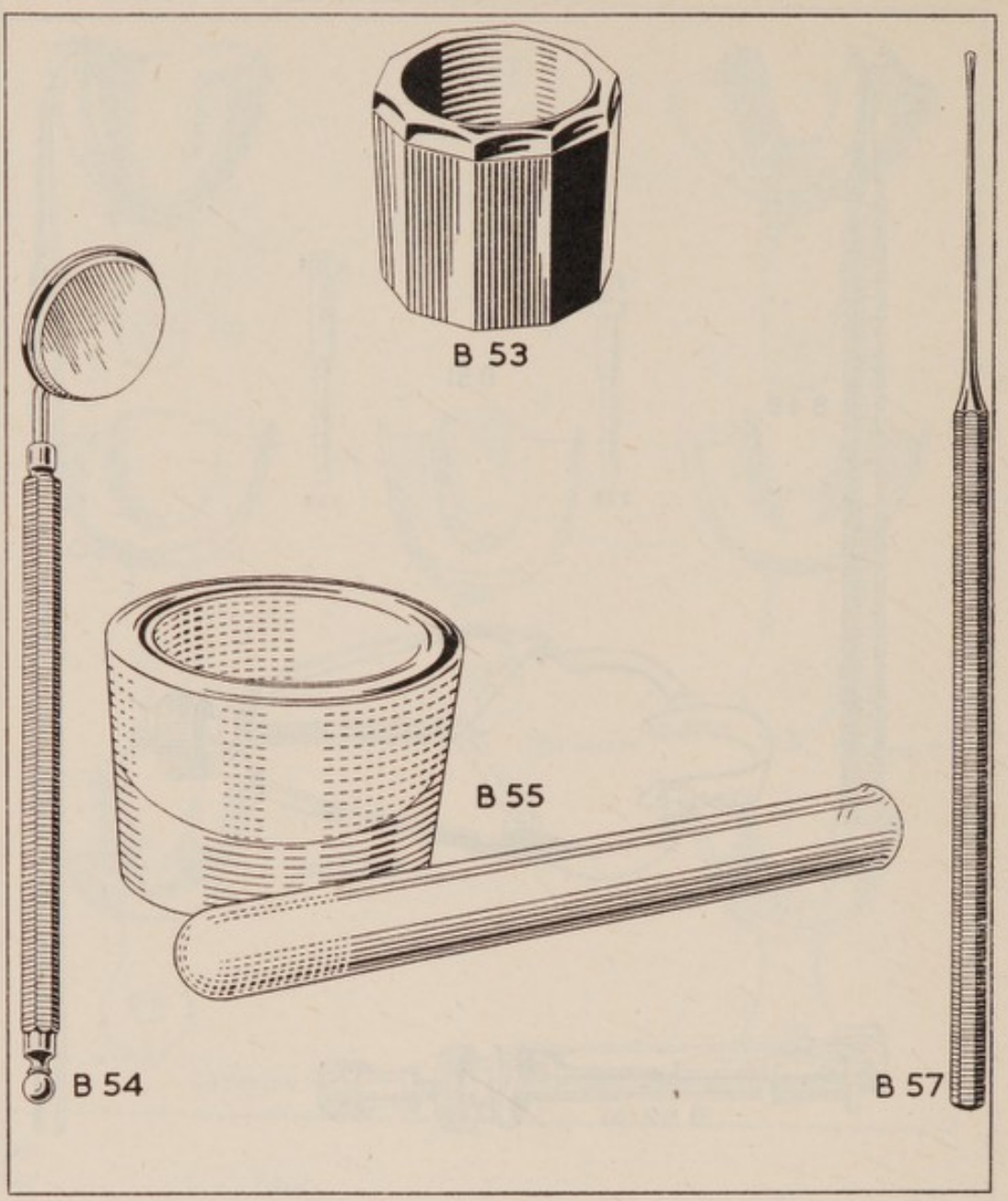
Schedule Number	*Item*	*Use*
B43	GAGS, Hewitt's, Set of 3, with Chain	To keep the mouth open during anaesthesia.
B44	GLOVES, Operating, Rubber (size to be stated)	Used by the operator in surgical procedures.
B45	GOWNS, Operating	Used by the dental surgeon or attendant.
B46	HANDPIECES : (*a*) Straight, No. 7 (*b*) Right-Angle, No. 2 (*c*) Contra-Angle, Fixed, No. 2	In which engine burs, straight or right-angle, are inserted. The handpiece is slipped on to the engine.



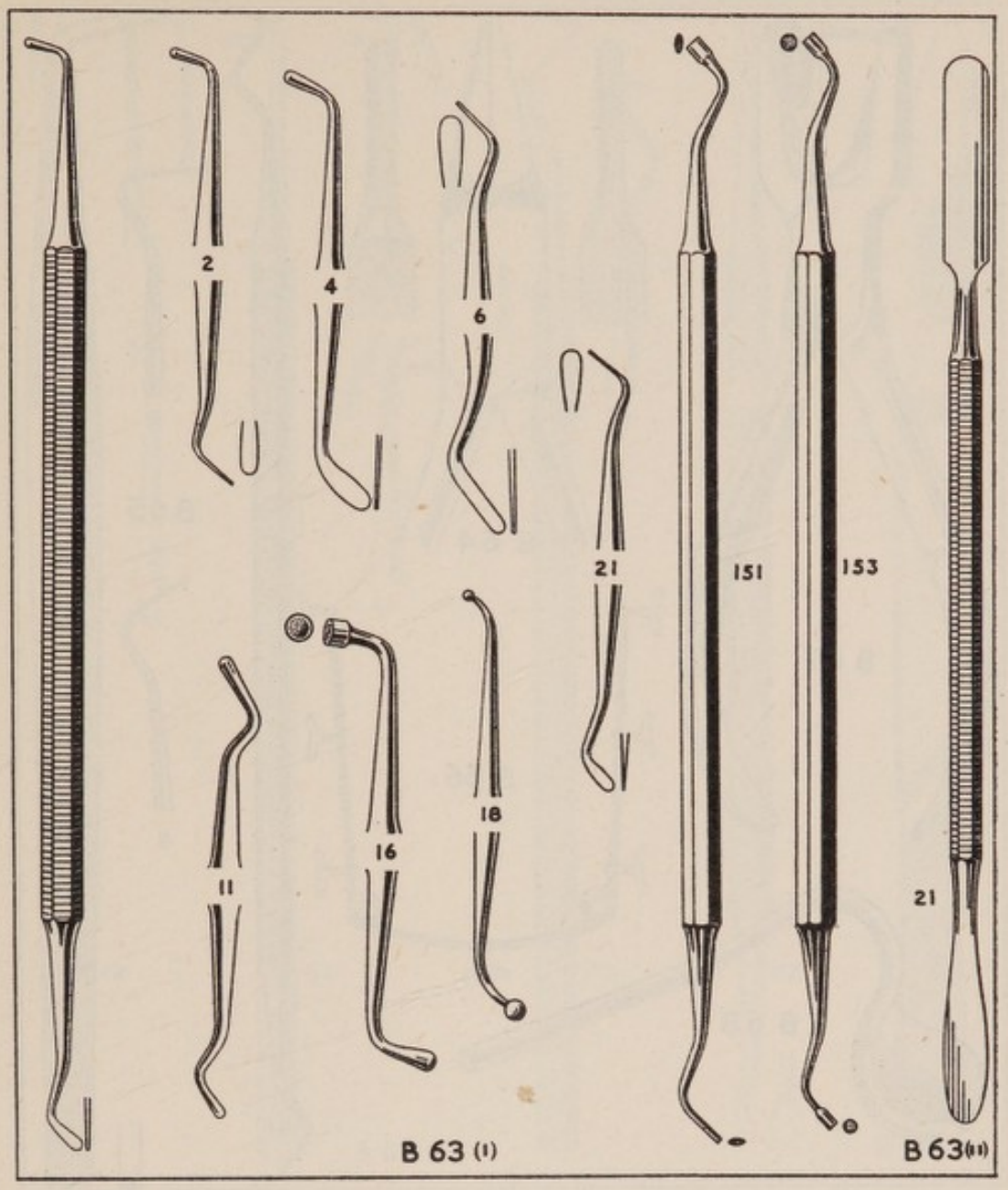
Schedule Number	*Item*	*Use*
B47	IMPRESSION TRAYS, A.D.C.'s : (*a*) Full Upper, Anatomical, size 1, 2, 3 (*b*) Full Lower, Anatomical, size 1, 2, 3 (*c*) Part Upper, Form A, sizes 0, 1, 2, 3 Form V, sizes 1, 2 Form Y, sizes 1, 2 (*d*) Part Lower, Form C : size 0, 1, 2, 3 Form U : size 2, 3	For holding impression material when taking impressions of the mouth, in connection with the construction of dentures.
B48	KNIFE, GINGIVECTOMY, with 6 Blades	For cutting the gum margins.
B49	LAMP, SPIRIT, Metal, A.D.C.'s Fig. 3	For general use—warming mouth mirror, gutta percha, flame sterilization, etc.



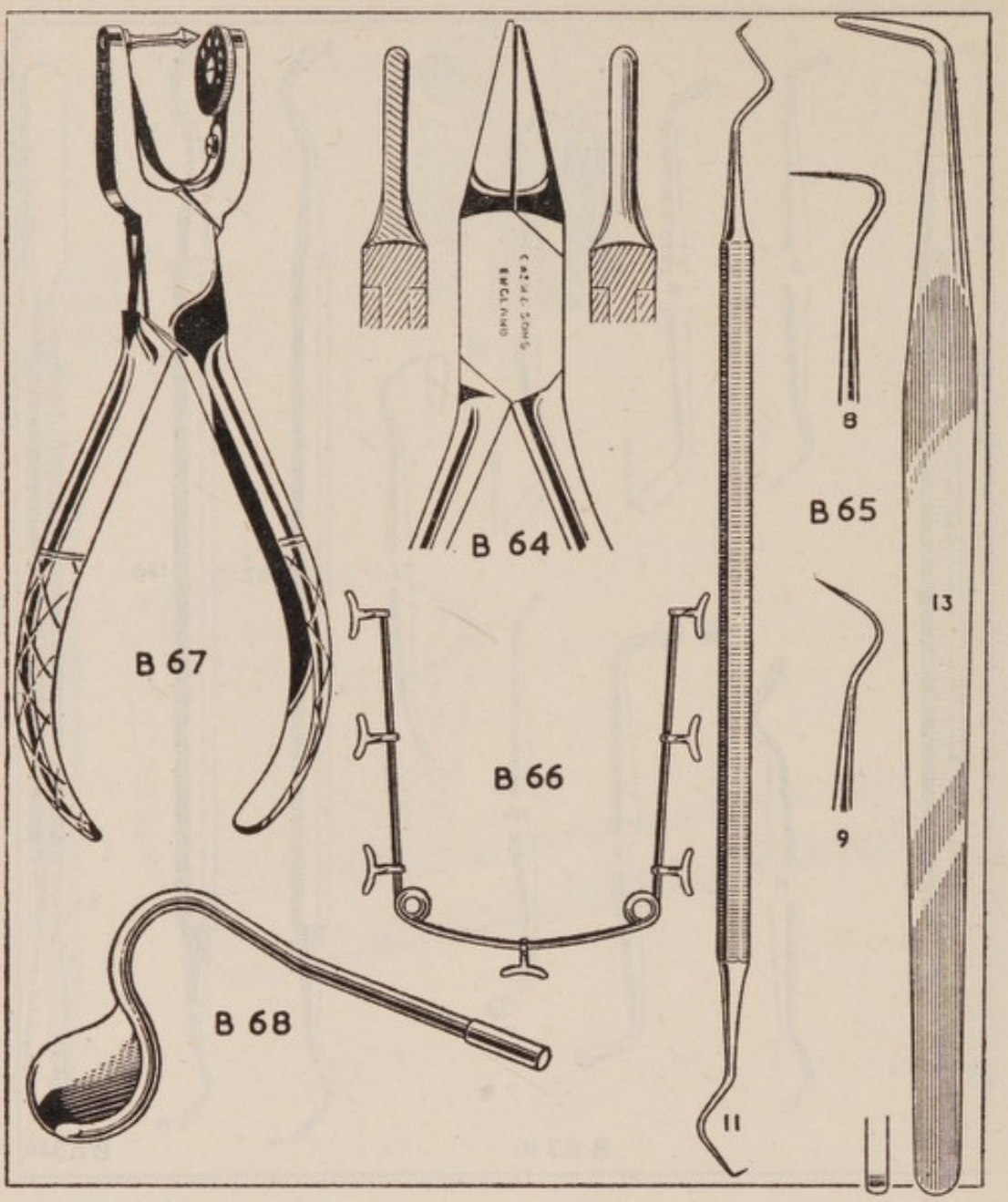
Schedule Number	*Item*	*Use*
B50	LANCET, Dally's, A.D.C.'s Fig. 3	Small bladed knife. Used for small incisions of the gum, or oral mucous membrane.
B51	MANDRELS : (*a*) for Straight Handpiece, No. 7, Huey's, A.D.C.'s Fig. 228 ; Moore's, A.D.C.'s Fig. 334 (*b*) for Right-Angle Handpiece, No. 2, Figs. as above	Appliance for fitting in handpiece, in which mounted carborundum wheels, polishing discs, abrasive rubber cups, etc., can be fastened.
B52	MATRIX RETAINERS : (*a*) Ivory's No. 1 (*b*) Bonnalie's	Appliances to keep in place a strip of metal, which acts as a " coffer dam " into which a filling is plugged, when the tooth wall is missing.



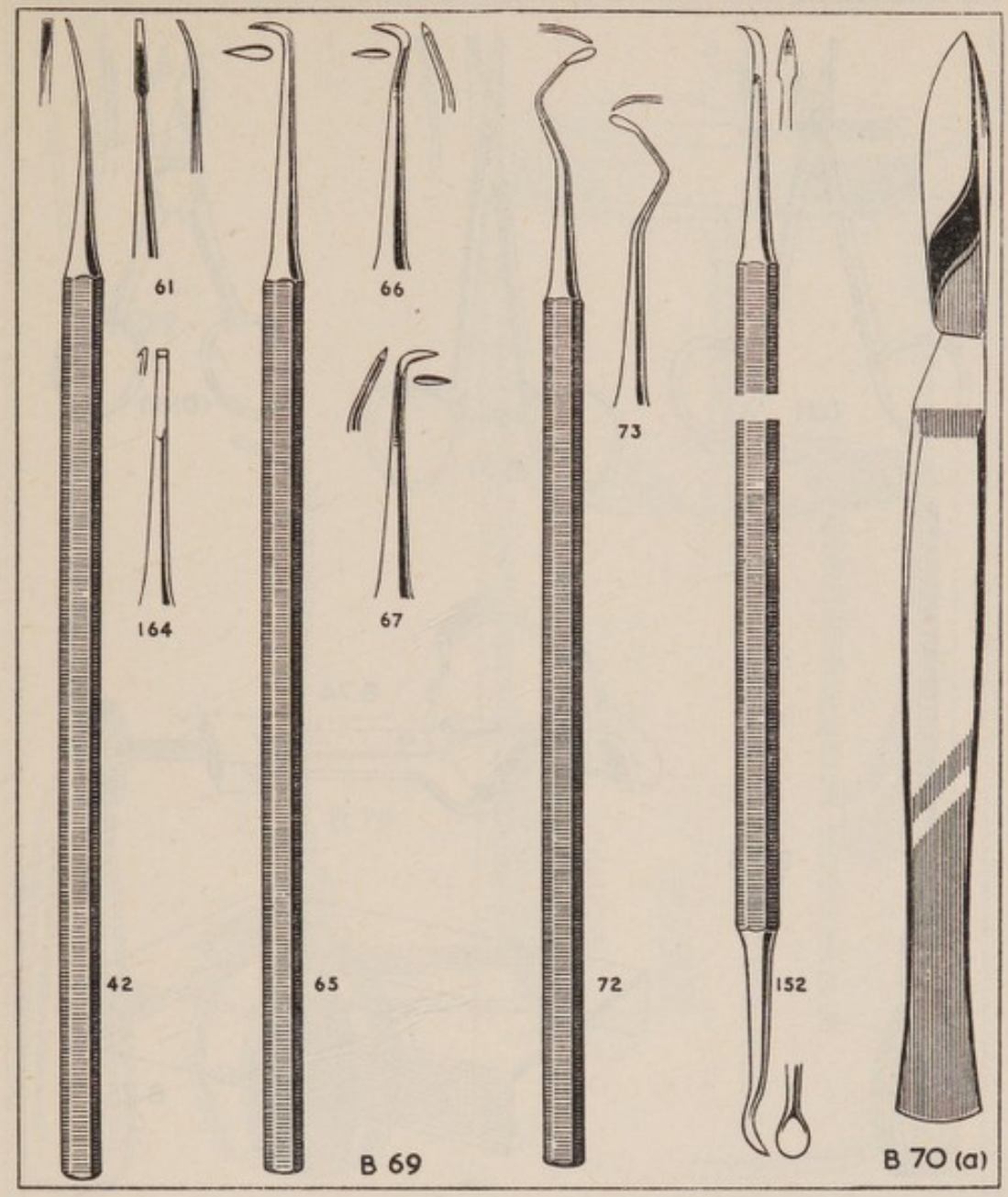
Schedule Number	*Item*	*Use*
B53	MEDICAMENT GLASS, Dappen's	Small glass vessel, for containing medicaments.
B54	MIRROR, MOUTH, HANDLES for	Handles, in which mouth mirror heads are inserted.
B55	MORTAR AND PESTLE, Glass	For mixing alloy and mercury, to form amalgam.
B56	NEEDLES, Curved, for Sutures, Small (Patt. 798)	For stitching gum flaps, sockets, etc.
B57	NERVE-CANAL PLUGGERS, A.D.C.'s Fig. 2	For inserting filling materials into a root canal.
B58	NIPPERS, Cutting, A.D.C.'s Fig. 47	For cutting wire or bands.
B59	OIL CAN, A.D.C.'s Fig. 4	For containing oil.
B60 (E46)	PLASTER KNIFE, Hand, A.D.C.'s Fig. 1	For cutting and trimming plaster models.



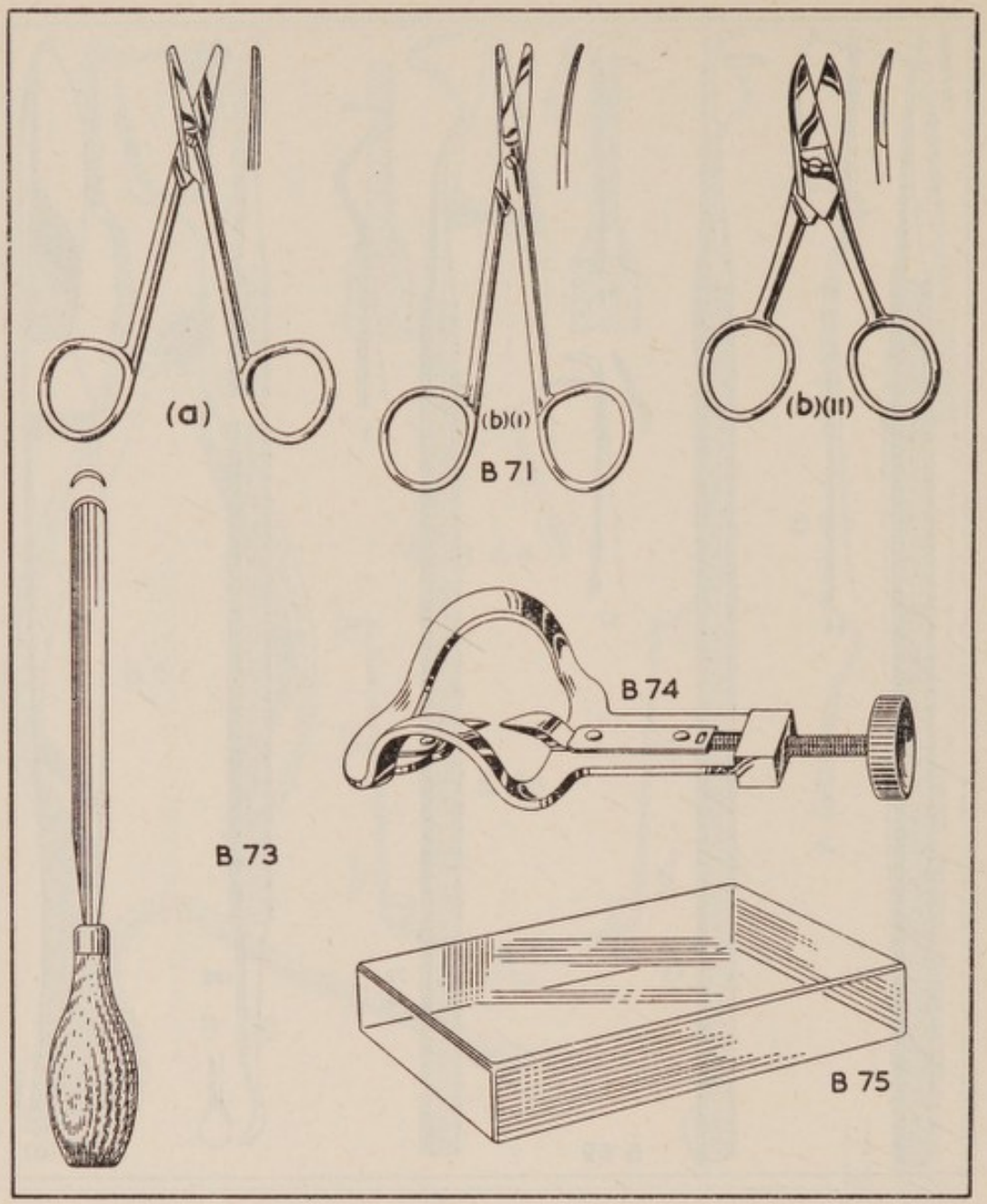
Schedule Number	*Item*	*Use*
B61 (E47)	PLASTER MIXER, A.D.C.'s Fig. 2	For mixing Plaster of Paris.
B62 (E48)	PLASTER SPOON, A.D.C.'s Fig. 1	For conveying Plaster of Paris.
B63	PLASTIC INSTRUMENTS :	
	(i) FILLING, Double Ended : (*a*) A.D.C.'s Figs. 1, 2, 4, 6, 11, 16, 18, 21 (*b*) Hopson's, A.D.C.'s Figs. 151, 153	(i) For inserting and shaping fillings. The ends are formed like a flat blade, or shaped knob, and are used alternately for plugging and shaping.
	(ii) SPATULA, Double Ended : (*a*) Bone, A.D.C.'s Fig. 11 (*b*) Stainless Steel, A.D.C.'s Fig. 21	(ii) For mixing cements.



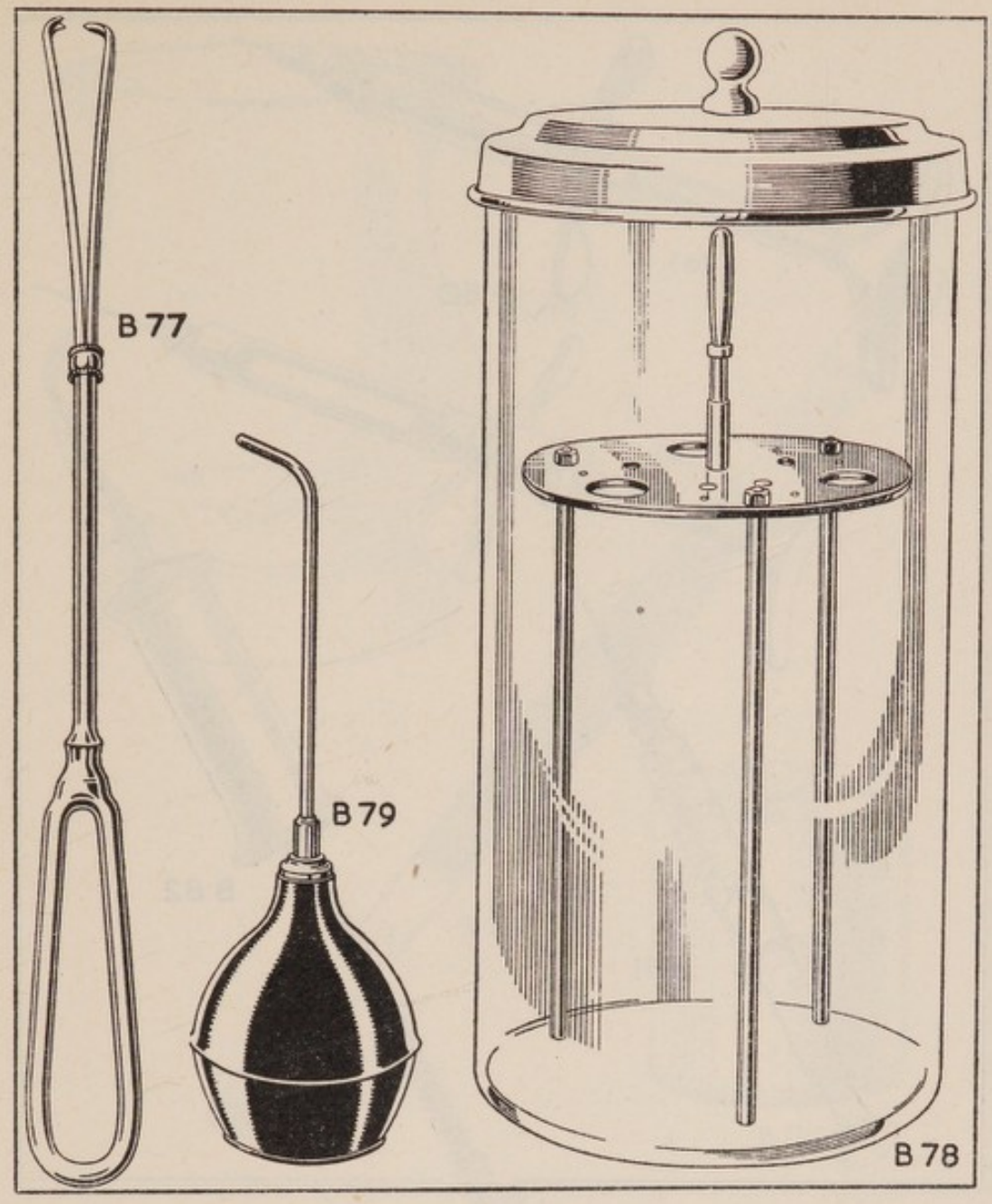
Schedule Number	*Item*	*Use*
B64 (E49)	PLIERS, Collar, A.D.C.'s Fig. 3	For bending bands on dentures.
B65	PROBES, A.D.C.'s Figs. 8, 9, 11, 13	For detecting cavities, exploring, etc.
B66	RUBBER-DAM FRAME	For keeping rubber-dam sheet in place.
B67	RUBBER-DAM PUNCH	For punching a hole in rubber-dam sheet, prior to placing it over a tooth.
B68	SALIVA EJECTOR TUBES, Metal, D.M.C.'s Fig. 9	For removing saliva from the mouth. It is attached by rubber tubing to the ejector portion of the spittoon.



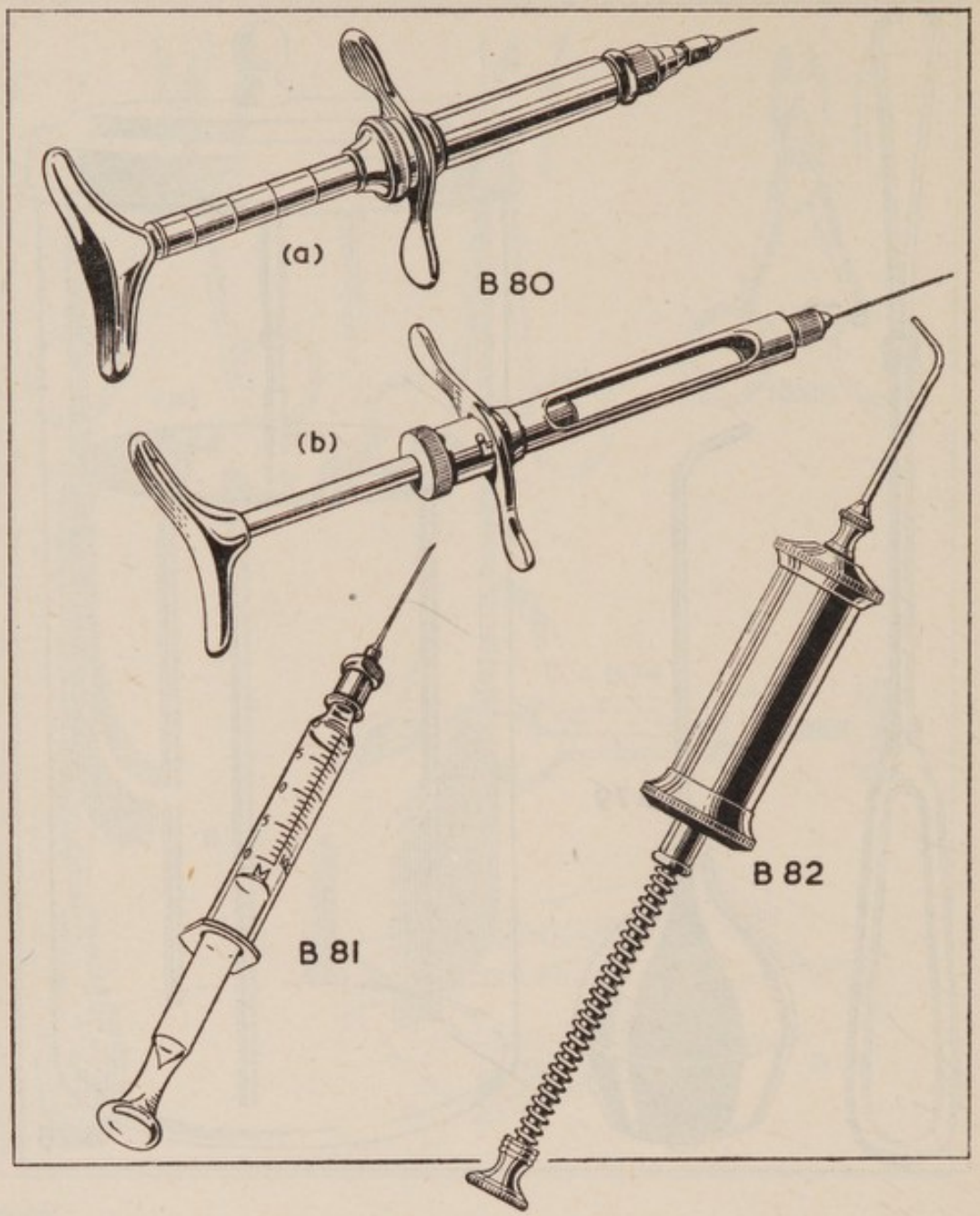
Schedule Number	*Item*	*Use*
B69	SCALERS, A.D.C.'s Figs. 42, 61, 65, 66, 67, 72, 73, 152, 164	For removing salivary calculus (tartar) from the teeth.
B70	SCALPEL :	For making incisions.
	(*a*) Small	
	(*b*) Bard Parker—	
	(i) Handles for, Fig. 3	
	(ii) Blades for, size 10	



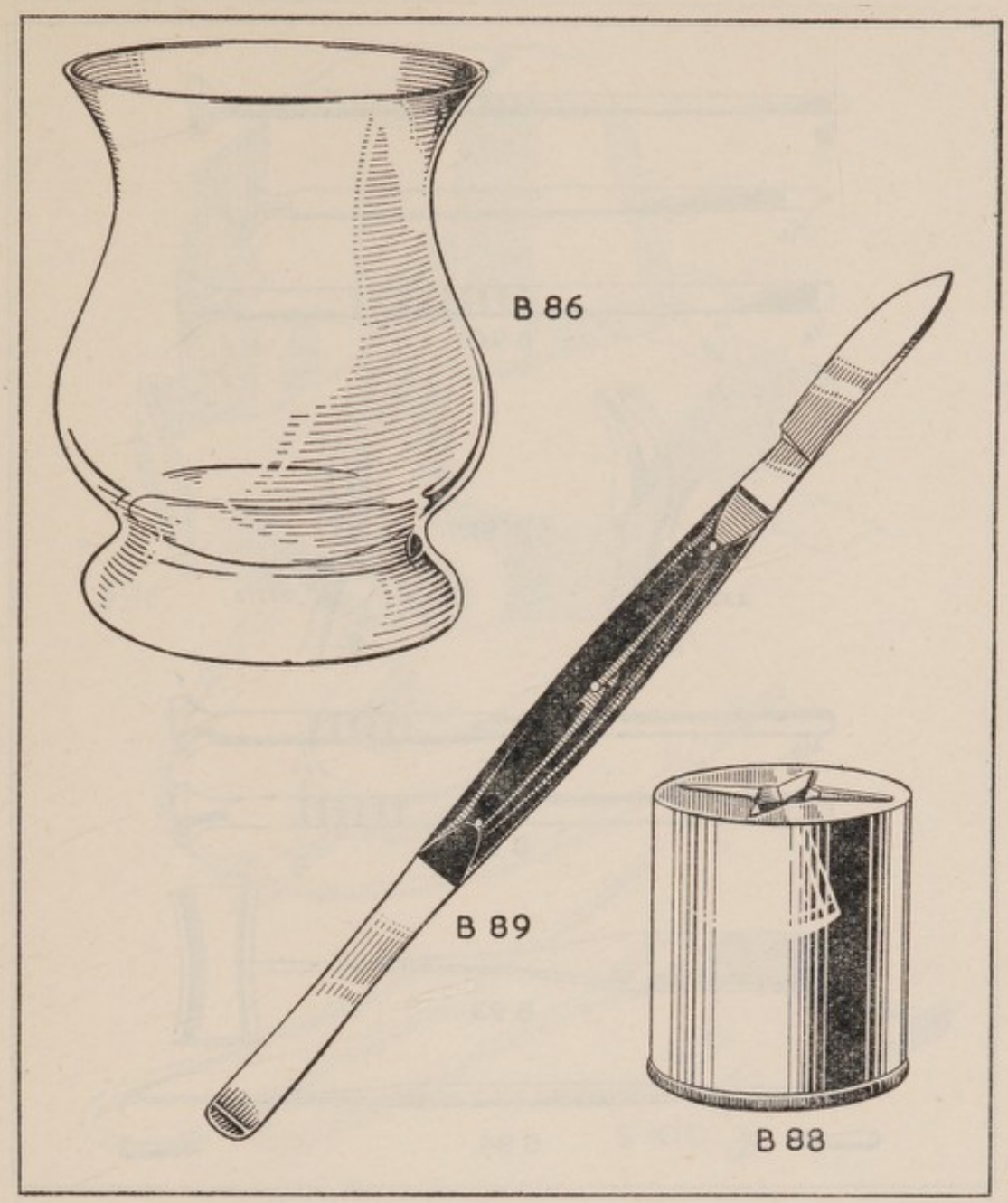
Schedule Number	*Item*	*Use*
B71	SCISSORS, SURGICAL : (*a*) Straight, D.M.C.'s Fig. A (*b*) Curved— (i) D.M.C.'s Fig. B (ii) Girdwood's	For cutting flaps of gum, etc.
B72 (E57)	SCREWDRIVER, Pocket, A.D.C.	For dismantling handpieces, etc.
B73 (E58)	SCULPTORS, in Wooden Handles, A.D.C.'s Fig. 2	For cutting vulcanite on dentures.
B74	SEPARATOR, Ivory's	For forcing the teeth apart, if necessary, when preparing fillings.
B75	SLAB, MIXING, Glass : $5\frac{1}{4}$-in. × $3\frac{3}{4}$-in. × $\frac{7}{8}$-in.	For mixing cement fillings.



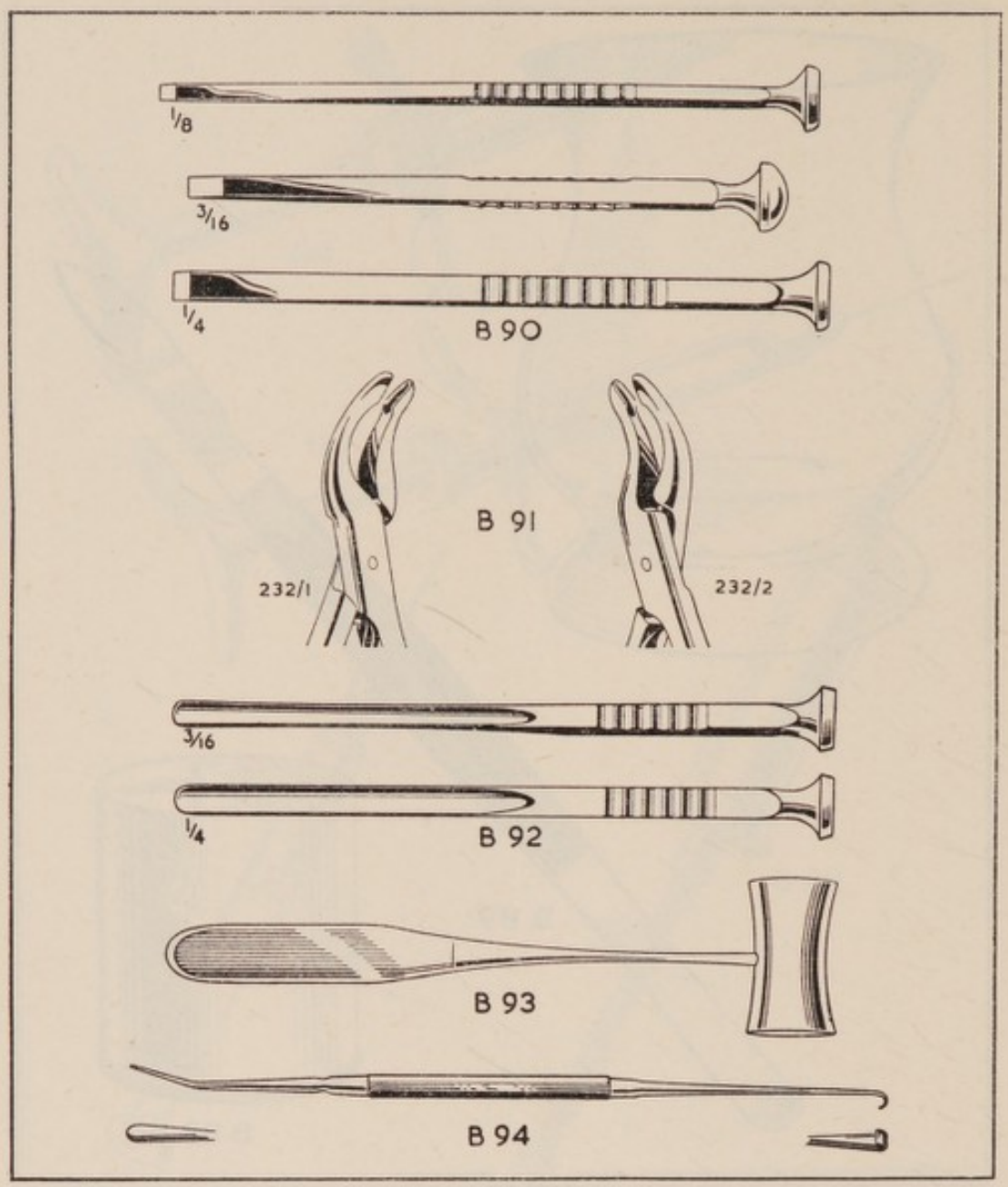
Schedule Number	*Item*	*Use*
B76	SOAP DISPENSER, for Liquid Soap	For holding liquid soap.
B77	SPONGE HOLDER, Straight	To grip surgical sponges, which are used during anaesthesia for swabbing, clearing the throat, etc.
B78	STERILIZING JAR, "Adco"	A glass container, filled with antiseptic fluid, for holding dental syringes.
B79	SYRINGE, Chip, A.D.C.'s Fig. 2 (also Spare Bulbs for)	An air syringe, for blowing debris from a cavity, and drying it.



Schedule Number	*Item*	*Use*
B80	SYRINGES, Dental : (*a*) Washerless, 40 minims, complete in Case (*b*) Cartridge Type	For dental anaesthetic injections.
B81	SYRINGE, Hypodermic, Glass, 20 minims, with Needles (Patt. 417)	For hypodermic injections of drugs in emergency.
B82	SYRINGE, Water, Hunt's (also Spare Nozzles for)	A water syringe, for irrigating.
B83	THERMOMETER, Clinical	For taking the patient's temperature.
B84 (E62)	TOOTH SHADE GUIDES, A.D.C.'s and D.M.C.'s	Guides for matching the colour of teeth.



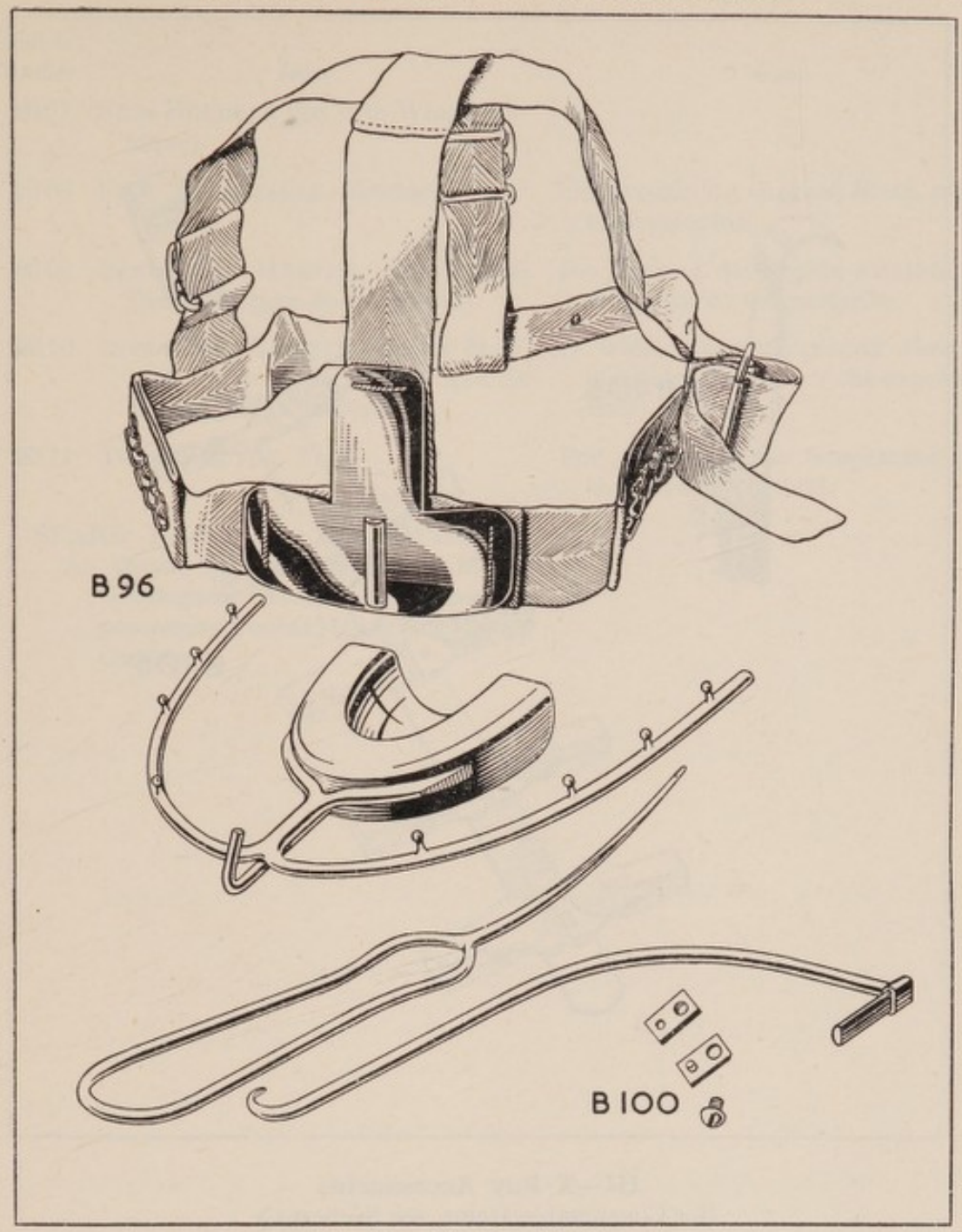
Schedule Number	*Item*	*Use*
B85	TUMBLERS : (*a*) Bakelite (*b*) Glass	For mouthwashes.
B86	VASE, Sterilizing, Glass	For containing antiseptic fluids, for sterilizing instruments.
B87 (E67)	VESSELS, Mixing, for Acrylic Material	For mixing acrylic material, for teeth, crowns and inlays.
B88	WASTE RECEIVER, Metal, A.D.C.'s Fig. 1	For disposal of small dressings, etc.
B89 (E70)	WAX KNIFE, A.D.C.'s Fig. 1	For manipulating dental wax, in connection with the construction of dentures.



SUPPLEMENTARY LIST (Supplied to certain Centres only)

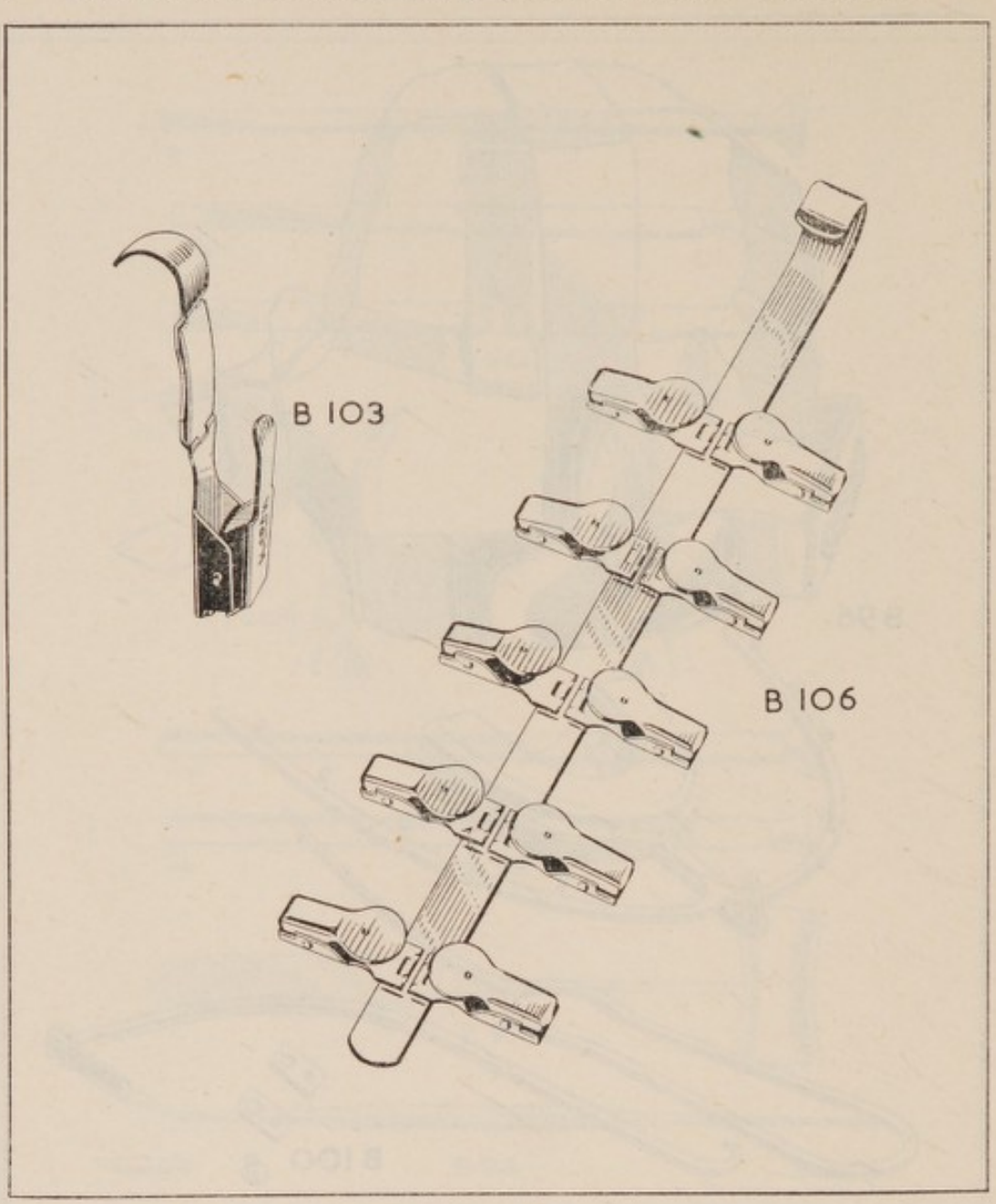
I—Oral Surgery Instruments

Schedule Number	*Item*	*Use*
B90	CHISELS, Bone, Lucas's, Down Bros., No. 0148/3, sizes $\frac{1}{8}$-in., $\frac{3}{16}$-in., $\frac{1}{4}$-in.	For surgical removal of bone.
B91	FORCEPS, Nibbling, Down Bros., Figs. 232/1, 232/2	For removing sharp bony edges.
B92	GOUGES, Surgical, Down Bros., Figs. 231/4, sizes $\frac{3}{16}$-in., $\frac{1}{4}$-in.	For removing bone.
B93	MALLET, Surgical, Down Bros., Figs. 139/4	For tapping bone chisels and gouges.
B94	PERIOSTEOTOME, Down Bros., Figs. 0151/1	For removing periosteum from the bone.



II—Maxillo Facial Items

Schedule Number	*Item*	*Use*
B95	ARCH WIRES, Jelenko Pattern	For use in the treatment of fractured jaws.
B96	KINGSLEY SPLINTS, Complete with Head Band, J-Hook, and Awl, Down Bros., Figs. 0153/1, 2	
B97	BANDAGES, MARTIN'S, Perforated Para Rubber: Gauge 21, 2½-in. × 15-ft.	
B98	LIGATURE SILK	
B99	LIGATURE WIRE, Soft Brass, .5 mm. 30-ft. coil	
B100 (F32)	SCREW LOCALIZING PLATES AND SCREWS, for Cast Metal Splints, Down Bros., Figs. 0154/6	



III—X-Ray Accessories

(for Consumable Items, see Section C)

Schedule Number	*Item*	*Use*
B101	Alarm Clock	For measuring developing time.
B102	Dark-Room Lamp, Wratten, Complete with "Safelight"	For giving a safe light while developing.
B103	Developing Clips, Dental	For holding a film during and after developing.
B104	Developing Tanks, Dental, Set of 3: 1 Large, 2 Small, No. D.1112	For developing.
B105	Film Dispenser, Dental	For containing films prior to use.
B106	Film Hangers, Developing, Dental	For holding several films, during and after developing.

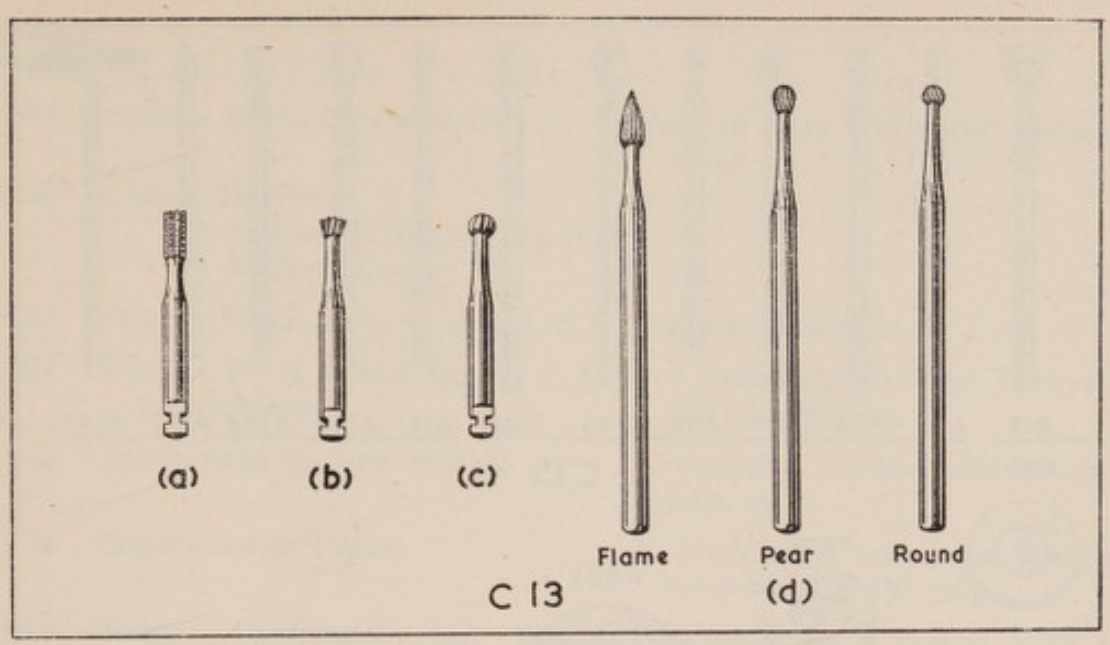
Schedule Number	*Item*	*Use*
B107	FILM HOLDERS (for Bite-Wing technique)	
B108	FILM RECEPTACLE, Dental	For containing exposed films, prior to developing.
B109	IMMERSION HEATER, for Dental Tank (voltage to be stated)	For heating developing solution to the required temperature.
B110	INTRA ORAL CASSETTE, 3-in. × 2¼-in. with Intensifying Screen and 50 Waterproof Envelopes	In which films are placed when it is required to reduce the exposure time.
B111	THERMOMETER, Tank	For measuring the temperature of the developing fluid.

SPARE PARTS FOR HANDPIECES

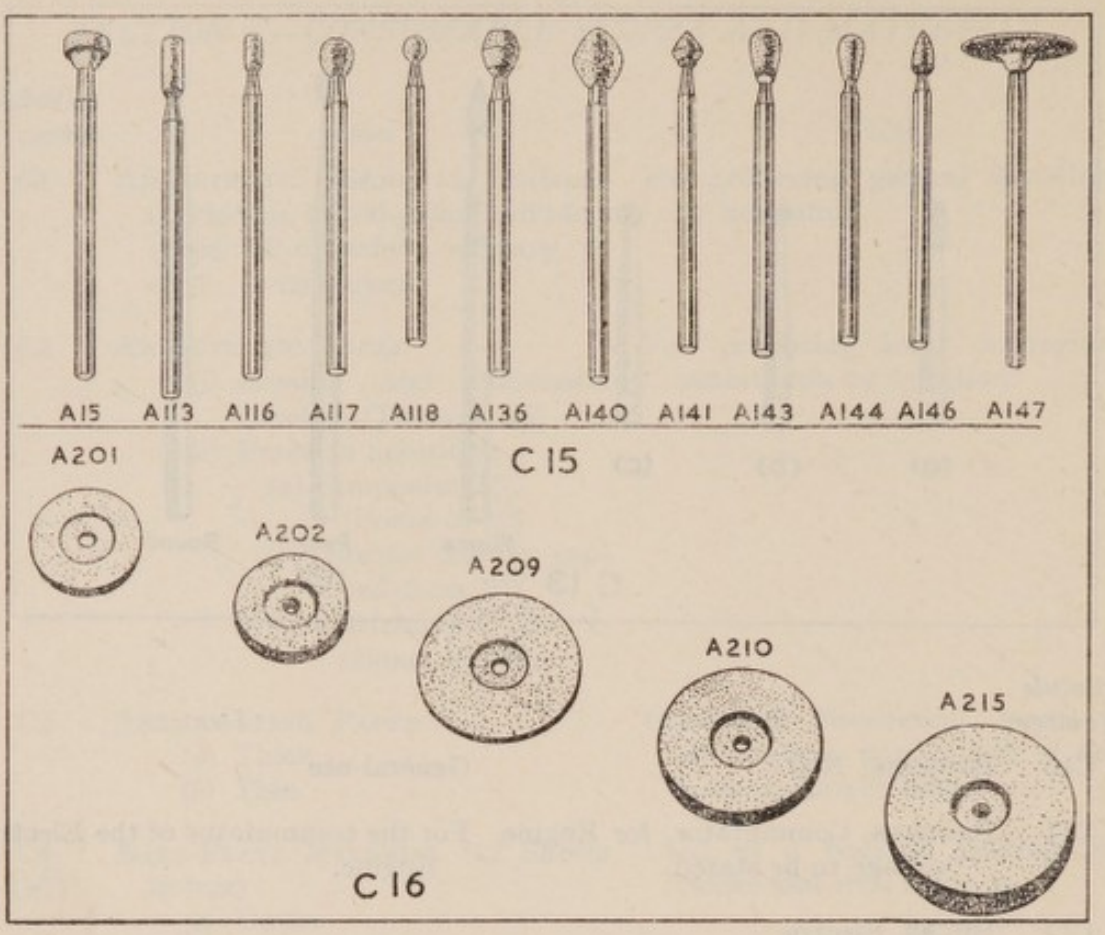
As shown in A.D.C.'s and D.M.C.'s Catalogues, available to centres possessing Dental Handpiece Repair Outfits.

SECTION C—CONSUMABLE STORES AND MATERIALS

Schedule Number	*Item*	*Use*
C1	ANAESTHETIC, GENERAL, Nitrous Oxide Gas, in 100-gallon cylinders (type of cylinder, ordinary or angle, to be stated)	For producing general anæsthesia by inhalation.
C2	ANAESTHETIC LOCAL : (i) Cocaine and Adrenalin Tabellae (Tubes of 25) (ii) Procaine Solution : (*a*) Ampoules 2% (Boxes of 10) (*b*) Bottles (rubber capped) 2-oz., 2% (*c*) Cartridges 2% (Boxes of 100)	For producing local or regional anaesthesia by injection.
C3	ARTICULATING PAPER : (*a*) Thick (*b*) Thin	Used for discovering errors in articulation, particularly of dentures (incorrect bite).
C4 (F7)	BASE-PLATE MATERIAL (12 Sheets in box) : (*a*) Upper (*b*) Lower	Used as a base in making bite blocks and trial dentures.
C5 (F9)	BOXES, for Denture Transit, Cardboard, 8-in. × 6-in. × 4-in.	For transmitting dentures.
C6	BROACHES, Nerve Canal (packets of 6) : (i) Barbed (*a*) Assorted (*b*) Fine (ii) Plain, Soft Tempered	(i) For removing the pulp from a root canal. (ii) For inserting medicaments and dressings into root canals.
C7	BRUSHES, Bristle Disc, for Engine : (i) FOR STRAIGHT HANDPIECE, No. 7— (*a*) Cup (*b*) Wheel (ii) FOR RIGHT-ANGLE HANDPIECE, No. 2— (*a*) Cup (*b*) Wheels	For cleaning and polishing teeth and fillings.
C8	BRUSHES, Camel Hair : (*a*) Small size (Swan) (*b*) Medium size (Goose) (*c*) Sticks for	For brushing liquid soap on plaster impressions
C9 (F10)	BRUSHES, Lathe : (*a*) Hard (Black) (*b*) Soft (White)	For polishing dentures



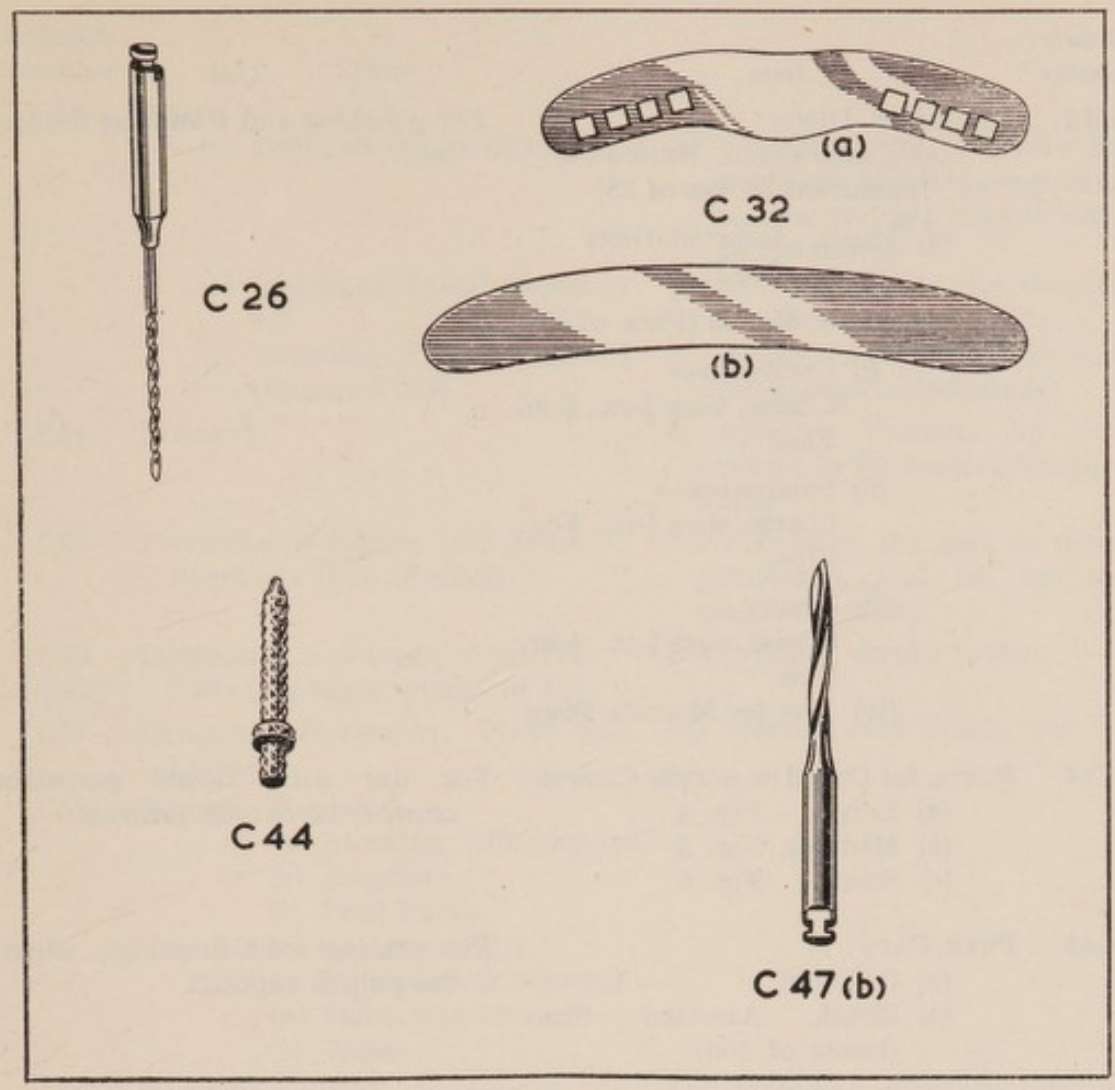
Schedule Number	*Item*	*Use*
C10	BRUSHES, Nail	General use
C11	BRUSHES, Commutator, for Engine (voltage to be stated)	For the commutator of the Electric Engine.
C12	BULBS, Electric : (*a*) for Atomizer (*b*) for Shadowless Lamp	
C13	BURS (packets of 6) : (i) FOR STRAIGHT HANDPIECE, No. 7— (*a*) Fissure, sizes 1, 2, 3, 4, 5, 7 (*b*) Inverted Cone, sizes 1, 3, 5, 8 (*c*) Round, sizes 1, 3, 5, 6, 8, 10 (*d*) Finishing, Flame, A.D.C.'s Fig. G; Pear, A.D.C.'s Fig. H; Round, A.D.C.'s Fig. G (ii) FOR RIGHT-ANGLE HANDPIECE, No. 2— (repeat as above, for No. 2 Handpiece)	Used in cavity preparation for cutting dental tissues.
C14	CARBOLIZED RESIN (½ oz. bottles)	Used as a temporary dressing.



Schedule Number	*Item*	*Use*
C15	CARBORUNDUM POINTS, Mounted : (i) FOR STRAIGHT HANDPIECE, No. 7— A.D.C.'s Figs. A.15, A.113, A.116, A.117, A.118, A.136, A.140, A.141, A.143, A.144, A.146, A.174 (ii) FOR RIGHT-ANGLE HANDPIECE, No. 2— (repeat as above, for No. 2 Handpiece)	Used in cavity preparation for grinding the dental tissues, and for polishing and trimming fillings.
C16	CARBORUNDUM WHEELS, Unmounted : (*a*) for Engine— A.D.C.'s Figs. A.201, A.202, A.209, A.210, A.215 (*b*) for Lathe— A.D.C.'s Fig. 122	Used in cavity preparation for grinding the dental tissues, and for polishing and trimming fillings. Also used for shaping artificial teeth.
C17 (F43)	CEMENT, MODEL (hard white sticky wax) in sticks	Used mainly in denture construction.
C18	CERATE, Soluble "Albucid" (in 1 oz. tubes)	An antiseptic.

Schedule Number	*Item*	*Use*
C19	COPPER RINGS (boxes of 100)	Used in inlay and crown preparation.
C20	CORDS, DRIVING : (*a*) for Electric Engine (10½-ft.) (*b*) for Foot Engine	
C21	COTTON WOOL PELLETS, sizes 1, 2, 3	For drying cavities.
C22	COTTON WOOL ROLLS, sizes 1, 2, 3, 4, or assorted	For excluding moisture from the site of operation.
C23	DENTALONE (in 2 oz. bottles)	A soothing medicament for pulpitis, etc.
C24	DEVITALIZING FIBRE	A preparation containing arsenic, for destroying the pulp.
C25	DISCS, Cardboard, for Waste Receiver	For use with a special type of waste receiver. Soiled discs are replaced by clean ones.
C26	DRILLS, Nerve Canal : (i) FOR STRAIGHT HANDPIECE, No. 7— Beutelrock's, sizes 2, 3, 4 (ii) FOR RIGHT-ANGLE HANDPIECE, No. 2— Beutelrock's, sizes 2, 3, 4	For preparing root canals.
C27	FILLING MATERIALS : (i) AMALGAM— (*a*) Alloy, Silver Tin (*b*) Amalgam, Copper (ii) CEMENT : (*a*) Oxyphosphate of Zinc, light yellow and light grey. (*b*) Oxyphosphate of Copper, Ames' black (*c*) Synthetic Porcelain, light yellow and light grey (*d*) Portex model cement (iii) GUTTA-PERCHA : Pink and white	(i) (*a*) For preparing amalgam (with mercury) for permanent fillings, usually in posterior teeth. (*b*) For fillings in posterior teeth, where total removal of caries is impracticable. (ii) (*a*) For lining cavities, and for fixing crowns, etc., in place. (*b*) For fillings in temporary molars, and for fixing metal capped splints. (*c*) For restorations in front teeth. (*d*) For fixing crowns. (iii) For retaining temporary dressings.
C28 (F18)	GLASS CLOTH, Fine : Grade No. 0 (Patt. 976A) No. 1 (Patt. 977A)	For polishing and easing dentures, etc.

Schedule Number	*Item*	*Use*
C29	IMPRESSION AND MODELLING MATERIALS :	
	(*a*) Composition, " Paribar " and " Stents "	(*a*), (*b*) (*c*) for taking impressions of the teeth and jaws, in connection with the construction of dentures
	(*b*) Zelex	
(F26)	(*c*) Plaster of Paris—Superfine (7 lb. tins)	(*c*) for casting models.
	(*d*) Plaster Stonehard (7 lb. tins)	(*d*) for casting models where extra hardness is required.
	(*e*) Compensating Model Material E.P.1 (14 lb. tins)	(*f*) for constructing bite blocks and trial dentures.
(F43)	(*f*) Wax, Modelling, Pink	(*g*) for taking impressions of a prepared tooth cavity, when an inlay is required, and in the preparation of the inlay.
	(*g*) Wax, Inlay	
	(*h*) Wax, Carving, Non-Residual	
C30 (F3 & 12)	KALLODENTINE (6 shades in a Pack) (also Cellophane Squares, 4-in.)	For making acrylic teeth, crowns, and inlays.
C31	LIGATURES : Silk (sterilized in sealed tubes), sizes 00, 0, 1 BPC	For stitching gum flaps, sockets, etc.
C32	MATRIX BANDS :	For use as a miniature coffer-dam, into which fillings are plugged, when the tooth-wall is absent.
	(*a*) for Ivory's Retainer No. 1	
	(*b*) for Ivory's Retainer No. 8 (Bonnalie's)	
C33	MERCURY, Pure (1 lb. jars)	Used with Silver Tin Alloy to produce Amalgam.
C34	MOUNTS, for Dental Syringe : D.M.C.'s Fig. B, Short Fig. C, Long Fig. E, Curved	Used for connecting hypodermic needles to the barrel of the dental syringe.
C35	MOUTH MIRROR HEADS :	To enable the operator to see the site of the operation, and to reflect light on to the area.
	(*a*) Plane, sizes 4, 6	
	(*b*) Magnifying, sizes 4, 6	
C36	MOUTHWASH TABLETS, Effervescent (bottles of 1,000)	For preparing antiseptic mouth-washes.
C37	MUMMIFYING PASTE, " Trio "	For mummifying the devitalized pulp, where its removal is impracticable.
C38	NAPKINS, 6-in. × 6-in.	For excluding moisture from the field of operation.
C39	NEEDLES, Hypodermic (tubes of 6), size : (*a*) $\frac{7}{8}$-in. (*b*) $1\frac{5}{8}$-in.	For use with the dental syringe.



Schedule Number	*Item*	*Use*
C40	NEEDLES, Hypodermic, for Cartridge Syringe (tubes of 12), size : (*a*) 1-in. (*b*) 1⅝-in.	For use with the Cartridge type of dental syringe.
C41	OIL :	
	(*a*) Lubricating, for Engine (2 oz. bottles)	(*a*) For lubricating dental engines and handpieces.
	(*b*) for Chair Reservoir (quart tins)	(*b*) Necessary for the operation of the pump mechanism of the dental chair.
C42	PLUNGERS, Spare, for Washerless Dental Syringe	For the dental syringe.

Schedule Number	*Item*	*Use*
C43	POLISHING DISCS : (*a*) Composition, Burlews's, assorted (boxes of 25) (*b*) Paper, Assorted Grits (boxes of 525) (*c*) Paper, More's (Pkts. of 50), (i) Cuttlefish— Coarse, sizes $\frac{7}{8}$-in., $\frac{5}{8}$-in. Fine, ,, (ii) Sandpaper— Coarse, sizes $\frac{7}{8}$-in., $\frac{5}{8}$-in. Fine, ,, (iii) Emery— Coarse, sizes $\frac{7}{8}$-in., $\frac{5}{8}$-in. Fine, ,, (iv) Box for Moore's Discs	For polishing and trimming fillings, etc.
C44	POSTS, for Dowel or Acrylic Crowns : (*a*) Large, Fig. 4 (*b*) Medium, Fig. 5 (*c*) Small, Fig. 6	For use with Dowel porcelain crowns, or acrylic crowns.
C45	PULP CAPS : (*a*) Celluloid (*b*) Metal, Assorted Sizes (boxes of 100)	For placing over dressings, where the pulp is exposed.
C46	PUMICE, Powdered, Superfine (1 lb. bags)	For polishing teeth, fillings, dentures, etc.
C47	REAMERS, Root, Girdwood's : (*a*) for No. 2 Handpiece—sizes 1, 2, 3 (*b*) for No. 7 Handpiece—sizes 1, 2, 3	For enlarging root canals.
C48	ROOT CANAL POINTS : (*a*) Absorbent Paper (*b*) Gutta-percha	(*a*) For dressing root canals. (*b*) For filling root canals.
C49 (F30)	RUBBER, Vulcanizing, Base	For pressure anæsthesia.
C50	RUBBER-DAM SHEET, 7½-ft. roll (in tins)	For excluding moisture from the site of operation.
C51	SILK FLOSS, Waxed (Reels of 12 yds.)	For removing debris from the gum margin.
C52	SOAP, LIQUID, Surgical (in 1 gallon drums)	For toilet purposes, and as a separating medium for plaster impressions.

Schedule Number	*Item*	*Use*
C53	STRIPS :	
	(*a*) Celluloid (boxes of 100)	(*a*) For excluding moisture from synthetic fillings during setting, and for giving a smooth surface to the filling.
	(*b*) Lightning, Metal (boxes of 12)	(*b*) Abrasive metal strips, for polishing fillings interdentally.
	(*c*) Polishing, Linen, Assorted (boxes of 144)	(*c*) Abrasive linen strips, for polishing fillings interdentally.
C54	TANOFEN	A sedative cement, for lining cavities, or for use as a temporary filling.
C55	TINCTURE OF IODINE AND ACONITE, Fleming's (1 oz. bottles)	For sterilizing the gum or mucous membrane, and for use as a counter-irritant.
C56 (F42)	TRIMMERS, ABRASIVE, Assorted Grits and Sizes (boxes of 12)	For grinding acrylic resins.
C57	TRIKRESOL-FORMALIN, Paste and Liquid	For treating root canals, etc.
C58	TUBING, Rubber :	
	(i) for Atomizer (silk covered) :	
	(*a*) Atomizer	
	(*b*) Foot Pump	
	(ii) for Gas Apparatus	
	(iii) for Spittoon (silk covered) :	
	(*a*) Saliva Ejector	
	(*b*) Waste	
C59	VARNISH, Copal Aether ($\frac{1}{2}$ oz. bottles)	For excluding moisture from synthetic fillings during final setting.
C60	WASHERS :	
	(*a*) for Atomizer (assorted)	
	(*b*) for Fountain Spittoon (assorted)	
	(*c*) for Injection Syringe (assorted)	
	(*d*) for Water Syringe	
C61	WICKS, for Spirit Lamp	
	X-Ray Items (Consumable)	
C62	DEVELOPER POWDERS (Boxes containing sufficient for $\frac{1}{2}$ gallon)	For processing films.
C63	FIXING POWDER (Boxes containing sufficient for $\frac{1}{2}$ gallon)	For processing films.
C64	FILMS, X-RAY, Dental :	
	(*a*) No. 5, $1\frac{5}{8}$-in. × $1\frac{1}{4}$-in. (Boxes of 2 doz.)	
	(*b*) No. 3A, Occlusal (Boxes of 1 doz.)	
C65	FILM MOUNTS, Dental :	
	For 6 negatives	
	For 14 negatives	

SECTION D—DRUGS AND MEDICAMENTS

Schedule Number	*Item*	*Use*
D1	ACIDUM CHROMICUM, 10% soln.	Chromic Acid. Used in the treatment of Vincent's infection.
D2	ACIDUM TANNICUM	Tannic Acid. Used in gum treatment, and as an astringent. Also used to arrest haemorrhage, in conjunction with other drugs.
D3	ACIDUM TRICHLORACETICUM	Trichloracetic Acid. Used for treating Vincent's infection, for cauterizing exposed cementum and desensitizing dentine.
D4	ADHESIVE PLASTER, ½-in.	
D5	ADRENALINI HYDROCHLORICUS, LIQUOR, B.P.	Adrenalin Chloride solution (0.1%). A haemostatic. Used for arresting haemorrhage. Used also in anaesthetic solutions in very weak concentrations.
D6	AETHYL CHLORIDUM (60 cc tubes)	Ethyl Chloride, a general and local anaesthetic.
D7	AETHER PURIFICATUS	Ether. An anaesthetic. Also a solvent of grease. Used for cleaning and drying cavities.
D8	ALCOHOL ABSOLUTUM (10 oz. bottles)	Used for drying cavities.
D9	AMYL NITRIS, Capsules (boxes of 12)	Amyl Nitrite. A powerful vaso dilator. When inhaled, causes the heart to beat rapidly, and quickens the pulse. Used as a heart stimulant.
D10	ARGENTI NITRAS : (*a*) Crystals (*b*) Points	Silver Nitrate. An astringent and caustic. An obtudent. Used for reducing the sensitiveness of dentine and exposed cementum.
D11	CHLOROFORMUM	Chloroform. An anæsthetic, and also a solvent of grease and of Gutta-percha.
D12	CORKS, Phial (assorted)	
D13	COTTON WOOL, Absorbent (1 lb. or ¼ lb. pkts.)	Used for dressings, swabs, etc.
D14	CREOSOTUM	Creosote. Used for root dressings.
D15	CRETA GALLICA	French Chalk. Used for Bite blocks, etc., and for keeping rubber in good condition.
D16	CUPRI SULPHAS, PULVIS	Copper Sulphate. An astringent. Used in gum treatment.
D17	DETTOL (½ gallon tins)	A disinfectant.

Schedule Number	*Item*	*Use*
D18	DETTOLIN (20 oz. bottles)	A disinfectant and mouthwash.
D19	GLYCERINUM	Glycerine. A soothing agent. When mixed with pumice powder, forms a paste for polishing teeth and fillings.
D20	HYDROGENII PEROXIDI, 10 vols. soln.	Hydrogen Peroxide. Effective against anaerobic bacteria. Used for its oxygen giving properties, in treating infected root canals and gums.
D21	LABELS, Gummed : (*a*) Green (*b*) Yellow	Yellow labels are used for poisons.
D22	LIQUOR AMMONIAE AROMATICUS	Sal Volatile. A remedy for fainting.
D23	LIQUOR ARSENICALIS, B.P.	A solution of arsenic. Used in treating Vincent's infection, usually in combination with Ipecacuanha wine.
D24	LIQUOR CRESOL SAPONATUS	Lysol. A disinfectant.
D25	LIQUOR IODI MITIS	Iodine. An antiseptic and counter-irritant.
D26	OLEUM CARYOPHYLLI	Oil of Cloves. A sedative for pulpitis. Forms a useful temporary filling, when mixed with zinc oxide.
D27	OLEUM EUCALYPTII	Oil of Eucalyptus. Mildly antiseptic. A solvent for Gutta-percha.
D28	PARAFFINUM LIQUIDUM	Liquid Paraffin. A lubricant. Used for handpieces, etc.
D29	PARAFFINUM MOLLE ALBE	White Vaseline. Used to exclude moisture from the surface of cement fillings during setting. A lubricant.
D30	PENICILLIN : (*a*) Lozenges (bottles of 50) (*b*) Dental Cones (jars of 50)	Used in treating infections of the mouth and gums.
D31	PHENOL LIQ.	Carbolic Acid. Used in making mouthwashes and as a disinfectant and an oblundant.
D32	PINS, Safety, 1-in.	
D33	POTASSII CHLORAS, LOZENGES	Used in acute infections of the mouth and gums.
D34	POTASSII SULPHAS	Potassium Sulphate. Used in the preparation of anti-expansion solutions, for use with Plaster of Paris.

Schedule Number	*Item*	*Use*
D35	Soap, Toilet, Carbolic	Toilet use.
D36	Sodii Alizarin Sulphonate	For colouring Plaster of Paris.
D37	Sodii Bicarbonas	Bicarbonate of Soda. An antacid.
D38	Sodii Chloridum, Pellets, gr. 40 (bottles of 500)	Common Salt. Used to prepare saline solutions, for syringing wounds, etc.
D39	Sodii Perboras	Sodium Perborate—a cleansing agent.
D40	Spiritus Methylatus	Methylated Spirit (obtained from Naval Stores).
D41	Sponges, Small Surgical	For swabbing blood and mucus.
D42	Strychninae Sulphas (1 c.c. ampoules), 1/100 gr. in 5 minims.	Strychnine Sulphate. For injection as a heart stimulant, in cases of emergency during anaesthesia.
D43	Tabella Ascorbici, B.P. 50 mg. (bottles of 500)	An anti-scorbutic drug in tablet form.
D44	Tabella Codeinae, Composit B.P.C. (bottles of 500)	Similar in use to "Aspirins."
D45	Tabella Formaldehydi, B.P.C.	Formaldehyde tablets. An antiseptic.
D46	Thymol	An antiseptic. An ingredient in mummifying agents.
D47	Tinctura Ipecacuanhae	Ipecacuanha Wine. Used sometimes together with Liquor Arsenicalis in the treatment of Vincent's disease.
D48	Tow, Surgical	For packing dentures, models, trials dentures, etc., for dispatch through the post.
D49	Tragacantha Pulvis	Tragacanth powder. A fixative for dentures.
D50	Zinci Oxidum	Zinc Oxide. Forms a temporary cement when mixed with oil of cloves.
D51	Zinci Chloridum	Zinc Chloride. An astringent and obtudent.

Schedule Number	*Item*	*Use*
	Equipment	
E1	ANVIL, Small, on Block (height 6-in.)	For shaping metal and for general purposes.
E2	APRONS (Cook's)	For protective wear.
E3	ARTICULATORS, Graham and Wood, A.D.C. Fig. 10	For fixing correct relative position of upper and lower models.
E4 (B5 & 7)	BASINS :	
	(*a*) E.I., 7¾-in. dia. (N.V. Patt. 6a)	(*a*) For general use.
	(*b*) Rubber, 4½-in. × 3½-in.	(*b*) For mixing Plaster of Paris.
E5	BLOCK, SOLDERING, Asbestos, 4½-in. dia.	A block on which soldering is done.
E6	BLOWERS, FOOT :	For producing a non-luminous jet of flame (coal gas) sufficiently hot for hard soldering.
	(*a*) Blowpipe, Fletcher's, C.10	
	(*b*) Bellows, foot	
	(*c*) Rubber discs, spare, for Bellows	
	(*d*) Rubber tubing	
E7	BLOWLAMP, Inclined Burner (N.S. Patt. B9,2900)	Worked with paraffin, produces a hot non-luminous jet of flame. For use where coal gas is not available.
E8	BORAX SLAB, Glass	For mixing borax with water.
E9	BUCKETS, Galvanized Iron, 3 gallons (N.V. Patt. C.1032)	General use.
E10	BURNERS, Gas :	Heating and melting wax. General heating purposes.
	(*a*) Bunsen	
	(*c*) Ring type, 7-in. dia.	
	(*d*) Tubing for burners, Rubber ⅜-in. bore.	
E11	CABINET, Wooden, for Teeth	Holding stocks of teeth.
E12	CASTING PRESS, SOLBRIG'S, Outfit complete, comprising :	For casting metals.
	(*a*) Stand, complete with Supports, Lever and Blowpipe	
	(*b*) Cylinders, Nos. 1, 2, 3 and 5	
	(*c*) Stands for Cylinders, Nos. 1 and 2	
	(*d*) Lids, Nos. 1 and 3	
	(*e*) Cones, Nos. 1, 2, 3 and 5	
	(*f*) Asbestos Discs, 2 doz.	
	(*g*) Sprue Wires, 2 doz.	
	(*h*) Coating Material ½ lb., Embedding Material 3 lb.	
	(*i*) Wax Sheets, 2 doz.	

Schedule Number	*Item*	*Use*
E13	DRYING FURNACE, SOLBRIG'S, Complete with Gas Burner	
E14	DOME, FIRECLAY, 5½-in. dia.	Used in casting metals.
E15	DRUMS, for Storing Plaster, ½ cwt. or 1 cwt. size	
E16	FLASKS : (i) Vulcanizing— (*a*) " Empire ," Large (*b*) " Empire," Small : (i) Clamp for above (ii) Wedges for above (*c*) " Jordan's," pin type (*d*) " Ladmores " (ii) For Acrylic processing " Ideal "	For containing dentures which are being processed.
E17	FLASK PRESS	For closing flasks prior to processing.
E18	HEATER, Plate Type, for Rubber	For softening unvulcanized rubber.
E19	JUGS, E.I., 2 pint (N.V. Patt. 225)	General use.
E20	KETTLE, E.I., 4 pint (N.V. Patt. C985 E)	General use.
E21	KETTLE, Mess, 1½ galls. (N.V. Patt. 123) (suitable for acrylic processing)	For boiling water in which flasks are immersed for acrylic processing.
E22	LADLES, Melting, 6½-in. dia. (N.S. B.10468)	For melting metals.
E23	LATHE, Electric (voltage to be stated)	For rotating carborundum stones used for grinding denture material or metal.
E24	LATHE ACCESSORIES : (*a*) Chucks, left— (i) Brush (ii) Wheel (*b*) Chucks, right— (i) Brush (ii) Wheel (*c*) Water-trough, porcelain, plain (*d*) Water-trough, porcelain, plain with drip-feed (*e*) Flexible Arm Attachment for lathe	For rotating burs and carborundum points.
E25	MOULDING OUTFIT, Complete	For casting soft metal dies.
E26	OILSTONE, White, in Box, 3½-in. × 1-in.	For sharpening tools.
E27	PAN, ACID, Boiling, Porcelain	For boiling acids.
E28	VICE, Parallel, 3¼-in. jaws (N.S. Patt. B11, C508)	General use.

Schedule Number	*Item*	*Use*
E29	VULCANIZER, Electric, D.M.Co.'s "E" Form No. 2	For vulcanizing rubber when dentures are made of vulcanite.
E30	VULCANIZER ACCESSORIES : (*a*) Collars, I.R. (*b*) Gauge, regulating (*c*) Heater Element, electric (*d*) Plugs, fusible (*e*) Spanner (*f*) Switch, automatic, electric (*g*) Thermometer	
Tools		
E31 (B9)	Blowpipe, Mouth, 13-in.	For smoothing wax.
E32	BROACHES, Workroom, A.D.C.'s Figs. 44, 46, 49, 53, 55, 60	General use.
E33	BROACH HOLDERS, 4-in., A.D.C.'s Fig. 1	
E34	CALLIPERS, Steel, 4-in.	For gauging plates, etc.
E35	CHISELS, Pearson's, A.D.C.'s Figs. 15 (Right) and 16 (Left)	For cutting denture material.
E36	CUTTERS, Williams', A.D.C.'s Figs. 8 and 9	For trimming dentures, particularly round the teeth.
E37	DIVIDERS, Steel, 4½-in.	For measuring.
E38	DRILL, Breast, Pattern N.S. 1280	For drilling holes in metal.
E39	DRILLS, Set of, for above : ¼-in. Pattern N.S. 2004 3/16-in. Pattern N.S. 2016 ⅛-in. Pattern N.S. 2034 1/16-in. Pattern N.S. 2056	For drilling holes in metal.
E40 (B34)	FILES, Half-round, 5-in. : (*a*) Bastard (*b*) Rough (*c*) Smooth	For filing acrylic material, vulcanite or metal.
E41	FILE CLEANER (steel wire bristles, with handle).	
E42	HAMMERS : (*a*) Hand, ½ lb. (N.S. Patt. B11,644) (*b*) Riveting, Medium.	General purposes.
E43	MALLETS : (*a*) Wooden, Iron-cased (*b*) Horn	General purposes.
E44	PIN PERFORATORS : (*a*) Double, Young's Adjustable A.D.C.'s Fig. 1 (*b*) Single, A.D.C.'s Fig. 2— (i) Pin-holder, for above (ii) Pins, for above.	For punching small holes in metal, when making a "backing" for "pin" teeth.

Schedule Number	*Item*	*Use*
E45	PLASTER, KNIFE, on Board, 16-in. long	For trimming plaster models.
E46 (B60)	PLASTER KNIFE, Hand, A.D.C.'s No. 1	For trimming plaster models.
E47 (B61)	PLASTER MIXER, A.D.C.'s Fig. 2	
E48 (B62)	PLASTER SPOON, A.D.C.'s Fig. 1	For conveying plaster.
E49	PLIERS, WORKROOM : (*a*) Collar, A.D.C.'s Fig. 3 (*b*) Contouring A.D.C.'s Fig. 12 (*c*) Cutting Nippers, bevelled, A.D.C.'s Fig. 47 (*d*) Pin-Roughing and Bending A.D.C.'s Fig. 24 (*e*) Plate, A.D.C.'s Fig. 25 (*f*) Stubs Flat and Half-Round, A.D.C.'s Fig. 47 (*g*) Stubs, Pointed, A.D.C.'s Fig. 40 (*h*) Stubs Snipe-Nosed, A.D.C.'s Fig. 41	For general purposes, but especially bending bands or wires.
E50	PUNCHES, PLATE, Flat, Thin, Oval, and Hollow	For forcing metal plates close to the necks of the teeth while on the metal casts.
E51	REAMER, BRUSH	For fitting wheels having wood centres to taper-screw chucks.
E52	RIFFLERS : (*a*) Oval, thin, curved, cut all over A.D.C.'s Fig. 1 (*b*) Half-round, bent, cut one side, A.D.C.'s Fig. 3	For cutting acrylic material or vulcanite.
E53	RUBBER PACKERS : (*a*) Curved A.D.C.'s Fig. 3 (*b*) Straight A.D.C.'s Fig. 4	For packing soft rubber into place prior to vulcanizing.
E54	SAW FRAME	For holding fret saws.
E55	SCISSORS, 6-in. Straight, A.D.C.'s Fig. 13	General purposes.
E56	SCRAPERS, Vulcanite, Left and Right, A.D.C.'s Figs. 6A and 7	For scraping vulcanite or acrylic material.
E57 (B72)	SCREWDRIVER, POCKET	General purposes.

Schedule Number	*Item*	*Use*
E58	SCULPTORS, in Wooden Handles: (*a*) Flat, A.D.C.'s Fig. 1— (i) Broad (ii) Medium (iii) Narrow (iv) $\frac{5}{16}$-in. (*b*) Gouge, A.D.C.'s Fig. 2— (i) Broad (ii) Medium (iii) Narrow (iv) $\frac{5}{16}$-in.	For cutting acrylic material or vulcanite.
E59	SHEARS, Plate: (i) Curved, 7-in.— (*a*) Left (*b*) Right (ii) Straight, 7-in.	For cutting metal.
E60	STOOLS, Workroom, Adjustable	
E61	STOVE, "Primus," Single Burner	To provide heat, when coal gas is unavailable.
E62 (B84)	TOOTH SHADE GUIDES, A.D.Co. and D.M.Co.	To match shades of teeth.
E63	TONGS, Flask, lifting	For removing flasks from the vulcanizer.
E64	TRIMMERS, "Mitchell's, for Vulcanite, A.D.C.'s Fig. 10	For trimming vulcanite.
E65	TUBING, Rubber, $\frac{3}{8}$-in. bore	
E66	TWEEZERS, Soldering, A.D.C.'s Fig. 8	General purposes.
E67 (B87)	VESSELS, Mixing, for Acrylic Material	For mixing acrylic monomer and polymer.
E68	WAX CARVER, A.D.C.'s Fig. 5	For carving wax.
E69	WAX CAN, Whipp's	For collecting melted wax.
E70 (B89)	WAX KNIFE, A.D.C.'s Fig. 1	For manipulating wax.

SECTION F—DENTAL LABORATORY CONSUMABLE STORES

Schedule Number	*Item*	*Use*
F1	ACIDS : (*a*) Hydrochloric, B.P. (*b*) Sulphuric, B.P. (*c*) Nitric, B.P.	For cleaning or dissolving metal.
F2	ACRYLIC, Denture Base Material : (*a*) " Kallodent "— (i) 333 (ii) 222 (for hot climates) (*b*) " Portex " (*c*) " Stellon "	For constructing acrylic dentures.
F3	ACRYLIC, Material, for Artificial Teeth, Crowns and Inlays : (*a*) " Kallodentine " (6 shades in a Pack) (*b*) " Portex " (*c*) " Stellon," C Pack and Refills	
F4	ALLOY, CASTING, Silver, Copper (Ingots)	For casting metal capped splints.
F5	BARS, LINGUAL, Stainless Steel, Long, Medium and Short	Used in the construction of some lower dentures.
F6	BARS, Strengtheners, White Metal	Metal bars inserted in dentures, for strengthening purposes.
F7 (C4)	BASE PLATE MATERIAL (boxes of 12 sheets) : (*a*) Upper (*b*) Lower	Used in making bite blocks and trial dentures.
F8	BORAX, Lump	Used in soldering
F9	BOXES, For Denture Transit :	
(C5)	Cardboard, 8-in. × 6-in. × 4-in.	
F10	BRUSHES, Lathe : (*a*) Hard, 3-in. dia. (black) (*b*) Soft, 3-in. dia. (white) (*c*) Palate, Hard, Short 1-in. (black) (*d*) Palate, Soft, Short 1-in. (white)	For polishing dentures.
F11	BRUSHES, Plate (Hand Polishing)	For polishing.
F12 (C30)	CELLOPHANE, Squares, 4-in.	Used in processing acrylic materials.
F13	CLAY, Modelling, for Fusible Metal	Used for casting soft metals into dies.
F14	CONES, Felt, Polishing : (*a*) Pointed, Large (*b*) Pointed, Small (*c*) Rounded, Large	For polishing. Used on the lathe.

Schedule Number	*Item*	*Use*
F15	CUSPS, Stainless Steel	Sometimes used on dentures in place of back teeth, when there is a " close bite."
F16	FRENCH CHALK	Used to prevent wax sticking to plaster.
F17	FUSIBLE METAL (1 lb. bars)	To construct soft metal dies.
F18	GLASS CLOTH, Grade, No. 0 (N.S. Patt. 976A) and No. 1 (N.S. Patt. 977A) (Sheets and Rolls)	For smoothing acrylic material metal or vulcanite prior to polishing.
F19	INVESTMENT COMPOUND : (*a*) Coating Material (*b*) Embedding Material	Used in casting and in hard soldering.
F20	METAL, German Silver, Plate No. 6	General use.
F21	METAL, " PYRAMETAL," Gold Substitute, for casting	Used instead of Gold for inlays, etc.
F22	METAL, Soft, Sheet : (*a*) Medium, No. 4 (for polishing plates) (*b*) Thick, No. 7 (for base plates)	(*a*) For producing a smooth surface on finished dentures. (*b*) For strengthening wax.
F23	METAL, Stainless Steel, Plate : 6-in. × 3-in., B and S gauge 23	For backing pin teeth, where necessary.
F24	METAL, Tin, Foil (Books of Sheets, 4-in. × 4-in.), gauges 20, 40, 60	Used in making acrylic crowns, etc.
F25	OIL, Lubricating for Engine (2 oz. bottles)	
F26	PLASTER OF PARIS, Superfine : (*a*) Superfine, in— (i) 1 cwt. bags (ii) Tin-lined cases (export only) (*b*) Stonehard (7 lb. tins) (*c*) E.P.1 Compensating Model Material (14 lb. tins)	Essential in denture construction, for models, etc.
F27	MOPS, Polishing, Calico, 3-in. dia.	For polishing dentures.
F28	PUMICE, Powdered, Fine	For polishing dentures.
F29	ROUGE	For polishing dentures.
F30	RUBBER, Vulcanizing (½ lb. boxes) : (*a*) Base (*b*) Pink (*c*) White	For constructing vulcanite dentures.
F31	SAWS, Fret : (*a*) Square for vulcanite (*b*) Flat, for metal.	For cutting denture material or metal.
F32	SCREW LOCALIZING PLATES AND SCREWS for Cast Metal Splints, Down Bros., Fig. 0154/6	

Schedule Number	*Item*	*Use*
F33	SEPARATING MEDIA : (*a*) Water glass (tins) (*b*) Cold Mould Seal (Winchester quarts)	Used in processing acrylic material.
F34	SHELLAC, Powdered	
F35	SOAP, Polishing, " Lustre "	For polishing.
F36	SOLDER, Silver	For soldering silver.
F37	SOLDER, Stainless Steel : (*a*) " Optimus " (¼ oz. pkts.) (*b*) " Easy-Flo," Strip (4 oz. bundles) (*c*) Flux for, " Easy Flo " (½ lb. tins)	For soldering stainless steel.
F38	STEARINE	For coating plaster models.
F39	SUCTION DISCS	For incorporating in dentures to increase suction.
F40	TEETH, Porcelain : (i) Pin Teeth— (*a*) Upper Anterior— (i) " Dencoform " (ii) Aurora " Vi-type " (ii) Diatoric Teeth— (*b*) Lower Anterior "Alston " (*c*) Upper and Lower Posterior— (i) " Dencoform " (ii) De Trey's (Authorized List of Moulds and Shades supplied on request)	Artificial porcelain teeth.
F41	TEETH, Acrylic	Artificial acrylic teeth.
F42	TRIMMERS, Abrasive (for Grinding Acrylic material) assorted Grits and Sizes (boxes of 12)	
F43	WAX : (*a*) Modelling, Pink (1 lb. boxes) (*b*) Sticky, white (Cement, Model) (in sticks) (*c*) Inlay (sticks) (*d*) Carving, Non-Residual	(*a*) Used in constructing bite blocks and trial dentures. (*b*) Used for sticking generally. (*c*) Used in the construction of inlays. (*d*) Used in construction of acrylic crowns and teeth.
F44	WHEELS, Carborundum, for Lathe, A.D.C.'s Figs. A.121, A.122, A.128	For grinding denture material and teeth.
F45	WHEELS Polishing, Cotton	For polishing. Used on the lathe.

Schedule Number	*Item*	*Use*
F46	WIRE :	General use. For constructing clasps used on dentures.
	(*a*) Binding, Iron, No. 18 Medium ($\frac{1}{4}$ lb. reels)	
	(*b*) Clasp, Stainless Steel, $\frac{1}{2}$ Round (1 oz. coils), Gauge 6 and 7	
	(*c*) Ligature, Stainless Steel (30-ft. coils) SWG 25 and 22	
	(*d*) German Silver, No. 3 (8 oz. coils)	

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