

GFB. 1.

Clean Catering

A HANDBOOK ON
HYGIENE IN CATERING
ESTABLISHMENTS

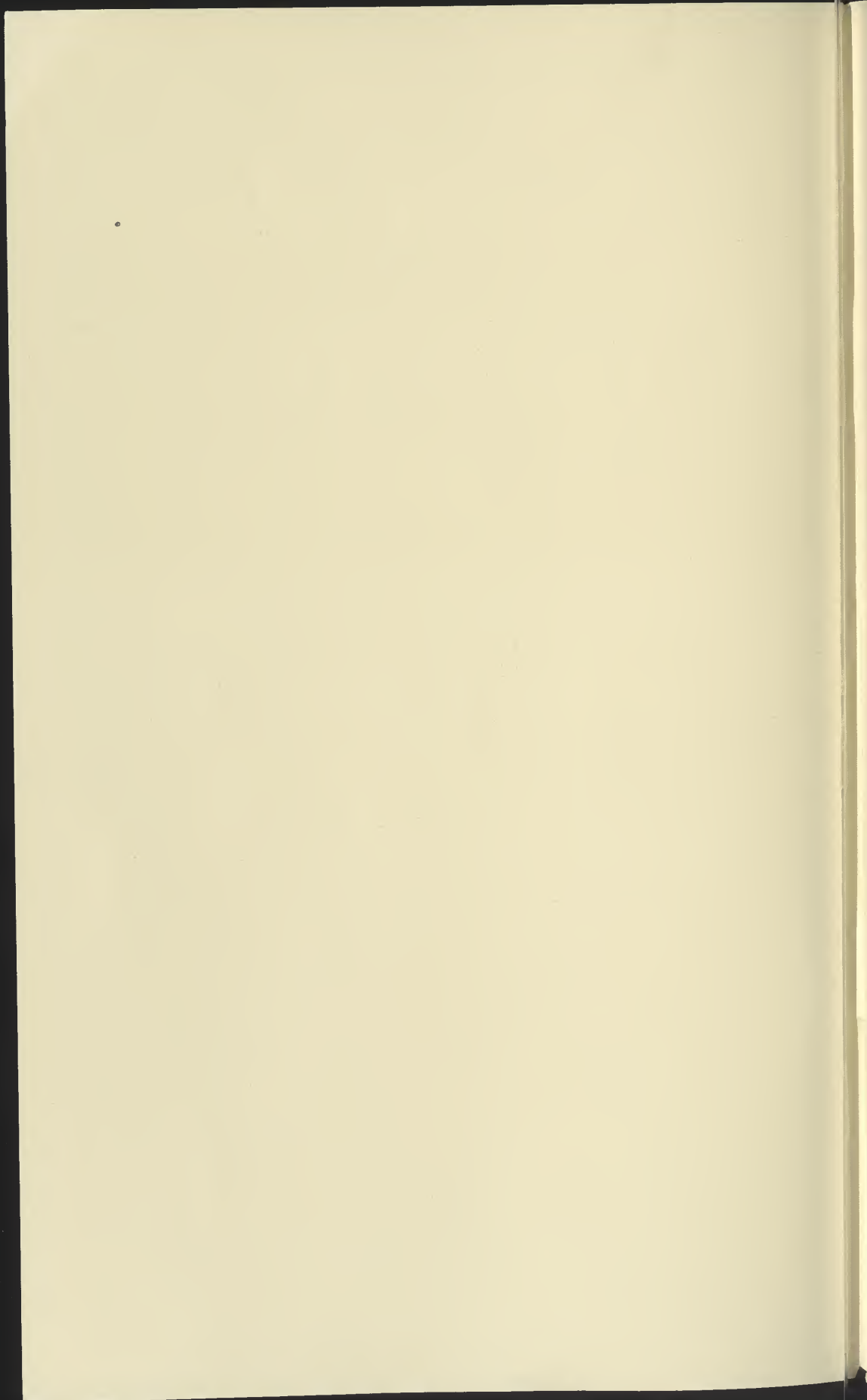


NATIONAL LIBRARY OF SCOTLAND
C
30
1953

LONDON: HER MAJESTY'S STATIONERY OFFICE

1953

PRICE 2s. 6d. NET



MINISTRY OF FOOD

*Clean
Catering*

A HANDBOOK ON
PREMISES, EQUIPMENT AND PRACTICES
FOR THE PROMOTION OF HYGIENE
IN CATERING ESTABLISHMENTS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1953

Introduction

CATERERS have long known that in their industry cleanliness is of the first importance. This is plain common sense. But during recent years it has become more fully understood *why* cleanliness is so important.

Food must be not only clean but safe. Food that looks clean and does not smell or taste bad may nevertheless be dangerous. Most people to-day know this, but the real nature of the risks and the best way to avoid them are not so widely known. There is therefore an increasing demand for advice and information on food hygiene, and the object of this booklet is to meet this demand.

The caterer's first object must be to run a profitable business. If he does not do this he will soon find that he has no business to run. He has to take into account such factors as the cost of food and equipment, the welfare of his staff, and the difficulties caused by inadequate premises. This booklet deals only with hygiene, but these other factors have not been ignored and most of the suggestions made can be carried out both simply and inexpensively. It cannot be too strongly emphasised, however, that where food hygiene is concerned money spent is money well spent.

The greatest single factor in maintaining cleanliness and safety is the mental attitude of those who handle food. If they have food hygiene at heart they will so conduct themselves that good habits become automatic. In an establishment where everyone is so trained but where the lay-out and equipment are out of date there is less risk to the public than in an establishment which is perfectly planned but where food is handled carelessly. On the other hand, well designed premises encourage clean habits.

To keep food safe a caterer does not need a knowledge of bacteriology, but he must understand how food becomes infected and how infection can be avoided. There are germs all around us, on everything we touch, in the air we breathe, and particularly in and on our bodies. Most of them are harmless, some are even beneficial, but there are others which cause food to deteriorate and a few which are really dangerous. Cuts or sores on the skin usually harbour dangerous germs. They may also be present in the bowel or bladder, or in the mouth or nose, and a person may be a "carrier" of such germs even though he is apparently quite well. If they are transmitted to food they can cause an outbreak of food poisoning. Usually a human being is responsible for the infection, but germs are also transmitted by birds, animals and insects, and particularly by flies.

In a favourable environment germs multiply very quickly; for this they need nourishment, moisture and warmth. Refrigeration will retard their multiplication but will not kill them. The first essential therefore is to prevent food from being contaminated, and the second is to prevent germs from multiplying. Fortunately most germs are killed at a temperature near boiling point, and food which has been thoroughly cooked and is eaten while hot is usually safe. If it is allowed to cool slowly any germs that may gain access will multiply enormously. There are a few kinds of germs which leave in the food a poison which resists heat; food that has been contaminated in this way cannot readily be made safe.

This booklet aims at giving practical advice. It neither sets out the law nor seeks to interpret it. The suggestions it contains are offered in the hope that they will be found useful by all caterers who have the cause of clean and safe food at heart.

CONTENTS

	<i>Page</i>
Introduction	ii
List of Illustrations	iv
CHAPTER I : PREMISES	
Section A : Location and Surroundings	1
B : Area	1
C : Lay-out of Premises	3
(a) General Plan	3
(b) Sanitary Accommodation and Cloak-rooms	7
D : Constructional Details	8
(a) Floors	8
(b) Walls	10
(c) Ceilings	12
(d) Doors, Stairs, Windows and Lifts	13
(e) Ventilation	14
(f) Lighting and Lighting Equipment	15
(g) Water Supply and Hot Water Apparatus	16
(h) Rats, Mice and Insects	20
CHAPTER II : EQUIPMENT	22
CHAPTER III : PRACTICES	
Section A : Welfare and Conduct of Staff	25
B : Health of Staff	29
C : Engagement of Staff and Allocation of Duties	30
D : Accidents and their Prevention	30
E : Storage of Food and Use of the Refrigerator	33
F : Preparation of Food (including Re-heated and Made-up Dishes)	40
G : Displaying and Serving Food	43
H : Storage and Disposal of Swill, Waste and Rubbish	46
I : Washing-up	47
J : Cleaning of Premises and Equipment	54
A Final Word	59

LIST OF ILLUSTRATIONS

PLATE	I Back Yard showing Rubbish and Swill Bins	} between pages 32 and 33
„	II Dry Food Store	
„	III Bakehouse Motors showing Mould	
„	IV Washing-up Sinks with Thermostatic Water Heater	

		<i>Page</i>
FIGURE	I Model Lay-out of Working Premises	2
„	II Plan	2
„	III Ventilation System	5
„	IV Potato Peeler and Gulley	6
„	V Washing-up Arrangements with Thermostatic Water Heater	7
„	VI Sanitary and Washing Facilities	8
„	VII Honeycombed Hardboard	11
„	VIII Cork Insets to Ceilings	12
„	IX Flange type Ventilator showing Vent Outlets	15
„	X Wastepipe Trap	18
„	XI Grease Trap	19
„	XII Cambered Floors	19
„	XIII Shelving	34
„	XIV Perforated Guard for Steam Pipe	50

*The drawings are by Mr. William Cue, District Sanitary Inspector,
Metropolitan Borough of Stepney.*

Chapter I. Premises

SECTION A. LOCATION AND SURROUNDINGS

Some catering establishments are not suitably located for the proper practice of food hygiene, and their proprietors are now finding that measures to protect their food, if practicable, are expensive. Anyone proposing to set up a new business will naturally examine possible sites primarily from the point of view of the amount of the rent and other overheads, the cost of conversion or equipping, and the number of potential customers; but considerations of hygiene should not be overlooked. Adequate lighting, ventilation and water supply should be regarded as essential.

The immediate neighbourhood should be examined for the presence of noxious trades and practices; from the point of view of hygiene an unpleasant smell is not so important as whether the air is charged with smoke or other dirty particles, or whether the surroundings contain potential or actual breeding-grounds for rats, mice, flies or harmful insects.

If prospective premises form part of a large building, the location of the water supply and other common services should be examined; particular enquiry should be directed to whether hot water would be speedily and regularly available in the kitchen, and to whether the sanitary conveniences and wash basins to be used by the staff are conveniently sited and adequate in number. Attention should be given to the facilities for handling and storing foodstuffs and to the routes by which the food would reach the establishment and the refuse would be removed. The inward route, at least, should be under the caterer's own control; dark and potentially dirty passages and alleyways should be avoided. Refuse should not have to be carried through the kitchen or dining rooms.

Ground floor premises are generally to be preferred, because they have the shortest routes for bringing in food and taking out garbage; but top floor premises are usually easier to light and ventilate.

The way the premises face should be considered. The food store should be on the north or north-east, where it avoids the heat from the sun; a kitchen on the east will get early morning sun which will help to make it a light and pleasant place to work in.

Underground kitchens present special difficulties. It is important that their windows should not open on to areas or forecourts so narrow that dirt or noxious matter could be kicked, thrown, dropped or blown into uncleanable recesses or even on to the food. Underground premises may be liable to flooding and drainage backflow, and they also necessitate special ventilation and lighting. The advice of a consulting engineer or the local public health department should always be sought before taking over such premises.

Premises where food is stored need to be cool and dry. If a caterer is considering setting up in an old building or a building in a remote rural area, it would be worth his while to make certain that the walls have been built with a proper and effective damp proof course. Ivy and other climbing plants look attractive but tend to retain moisture, to keep walls damp, and to make it easy for insects to enter the premises.

SECTION B. AREA

It is difficult to suggest precise standards of space, since space requirements depend not only on the total number of meals served during a working period and the number of meals served at once when the dining-room is full, but also on the type of meals provided and the number of choices on the menu.

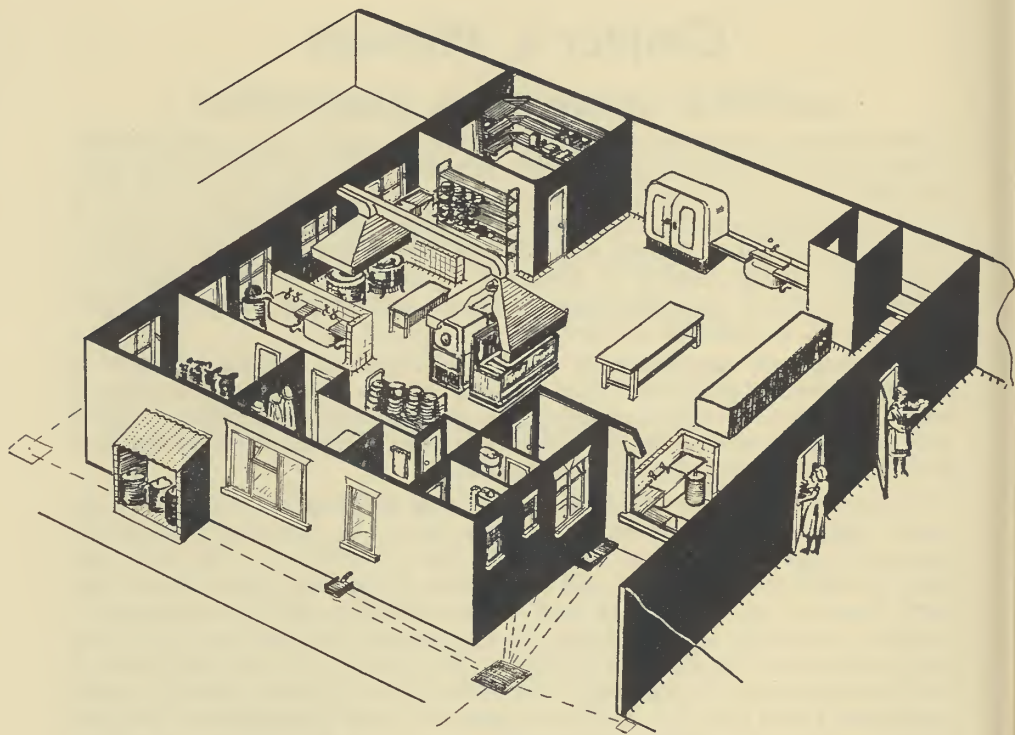


Figure I Model Lay-out of Working Premises

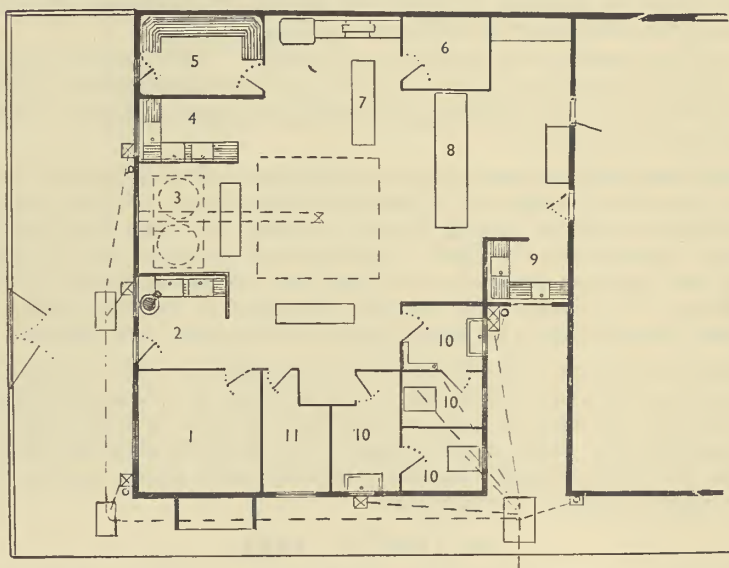


Figure II Plan

- | | | |
|--------------------------|--------------------|------------------|
| 1. Vegetable store | 5. Dry food store | 9. Crockery wash |
| 2. Vegetable preparation | 6. Linen store | 10. Lavatory |
| 3. Boilers | 7. Dry preparation | 11. Staff room |
| 4. Pan-wash | 8. Servery | |

Dining Rooms. It is undesirable for customers to be crowded together, since it is essential for the waitress to have clear access to every part of every table, so that dirty dishes and cutlery can be removed promptly and the tables kept clean. The dining rooms should be large enough for the provision of ample racks for hats and coats, as well as ledges for parcels, books, gloves, etc. Coat hooks should be far enough from the tables to keep coat-tails from overhanging them.

It is suggested that, where the maximum capacity is not more than fifty persons, fifteen square feet of dining space should be allowed for each person ; where the maximum capacity is above fifty, twelve square feet would be sufficient.

Working Premises. These should be large enough to allow employees to carry out their work comfortably, without congestion on traffic lines, crowding at work-tables and queueing for the use of sinks ; but they should not be so large as to entail unnecessary walking about. An employee will tend to neglect hygienic practices if they involve additional walking, waiting or working uncomfortably close to a colleague. There must be sufficient table and shelf space to allow used and unused utensils to be kept apart from each other and from food in course of preparation.

The kitchen (including the food preparation and washing up rooms or zones) should occupy a space equal to approximately half the area of the dining room, but rather more than this is necessary in smaller establishments. Every catering establishment should contain a room, used solely as a kitchen, not less than eight feet in height and with a minimum floor area of 100 square feet clear of furniture, fittings, and stored goods. If more than three people are employed in the kitchen, there should be an additional thirty-three square feet of floor area similarly clear for each person above three in number.

SECTION C. LAY-OUT OF PREMISES

(a) General Plan

This booklet does not set out hard-and-fast rules for the lay-out of premises or the arrangement of kitchens. Few caterers are in a position to model or re-model their premises exactly as they would wish ; and the object in view—hygienic catering—can be achieved with many different kinds of lay-out. Both this section and Figures I and II indicate what is considered to be a good hygienic arrangement ; and it is suggested that caterers should study them as recommendations rather than rules. The key-note in a catering establishment should be cleanliness ; and the premises should therefore be planned in whatever manner will make it easy to keep the place clean.

The greater the distance over which food has to be carried, and the more often it has to be handled, the greater the chance of its becoming contaminated. Therefore, the ideal to aim at is to have everything moving forward in orderly progression—from delivery to food preparation, cooking, service and washing-up.

The lay-out should be planned with a clear idea of the purpose of every room. Miscellaneous storerooms and unnecessary passages should be avoided. A good deal could be done to improve many catering establishments if some partition walls were removed and some dark, lumber-littered passages eliminated.

A goods entrance, separate from the customers' entrance, is essential for hygienic planning. The most convenient arrangement is for this goods entrance to open from a *yard*, so situated that delivery vans can pull right up to the door of the building. The yard should have an impervious and even

surface, a water standpipe, tap and washing-down hose, raised and covered accommodation for refuse bins and swill bins, and adequate drainage. If solid fuel is used, the entrance to the fuel store should be in the yard (Plate I).

Close to the goods entrance should be the *vegetable storage room*, which should be cool, dry, well ventilated and large enough to allow for orderly storage. It is convenient for this room to be against the wall of the yard, partly so that the floor can be sloped to enable water used for washing down to drain to an outside gully and partly so that it can have an entrance direct from the yard—which will keep some dirt off the rest of the premises. (For storage of vegetables, see pages 35-37. For cleaning, see pages 54-57. The work of vegetable preparation (whether done in a separate room or in a zone of the kitchen) should be carried out close to the vegetable store and close to the yard and refuse bins—so that most of the dirt which usually accompanies raw vegetables does not get further into the premises than is absolutely necessary.

Near the entrance should come the *dry food store*, which should be fly-proofed by fixing removable gauze screens over windows and door openings; in addition, the walls should be treated with residual insecticides once every six or seven weeks. The room should be dry, well lit and ventilated and at least 7 ft. 6in. high. This room should be used exclusively as a store and therefore water is not essential, but water for cleaning should be close at hand (Plate II).

The Kitchen. This should never be used as a thoroughfare to other parts of the building. In some establishments the kitchen is divided into a number of separate rooms and in others the work is done in one large room divided into zones. The second method is illustrated in Figures I and II partly because it facilitates cleaning, and avoids some handling of the food, and partly because an open kitchen enables the person in charge to keep the whole staff under observation; but satisfactory arrangements are possible under either system, and a good deal depends on the size and nature of the business, the number of the staff and other factors.

When planning a kitchen, the chief factors to consider should be the flow of work, the nature of the various operations and the positions of windows, doors and drains; it is more important to make the fullest possible use of natural lighting and the most efficient use of drainage than it is to preserve a symmetrical appearance.

Equipment should be so placed as to allow plenty of room for cleaning. Narrow spaces—for example, between two hot cupboards or between equipment and counter—are very difficult to clean and tend to provide lodgment for food debris and insects. Built-in-cupboards and other fixed kitchen units may be necessary for saving space in a small kitchen, but some of the units designed for domestic use have inaccessible cavities and ledges, especially near the floor level, and generally speaking, free-standing equipment is much more hygienic. An island lay-out generally makes for easier cleaning of equipment, but two large pieces of equipment placed back to back may be as difficult to clean as a block placed against the wall. It is, in general, a good plan to have the work-tables against the walls between the sinks and to have the ovens, stoves and mixing machines in the centre of the room. The work-tables should be movable for easy cleaning. Stoves usually require a canopy and an exhaust fan system of ventilation to draw off the fumes (Figure III). In some kitchens the stove is placed against the chimney breast so that the exhaust pipe can be run straight into the flue, but this is not always convenient in adapted buildings. An upright chimney pipe is ineffective unless its outlet is higher than the surrounding buildings, and a stove exhaust pipe which is run

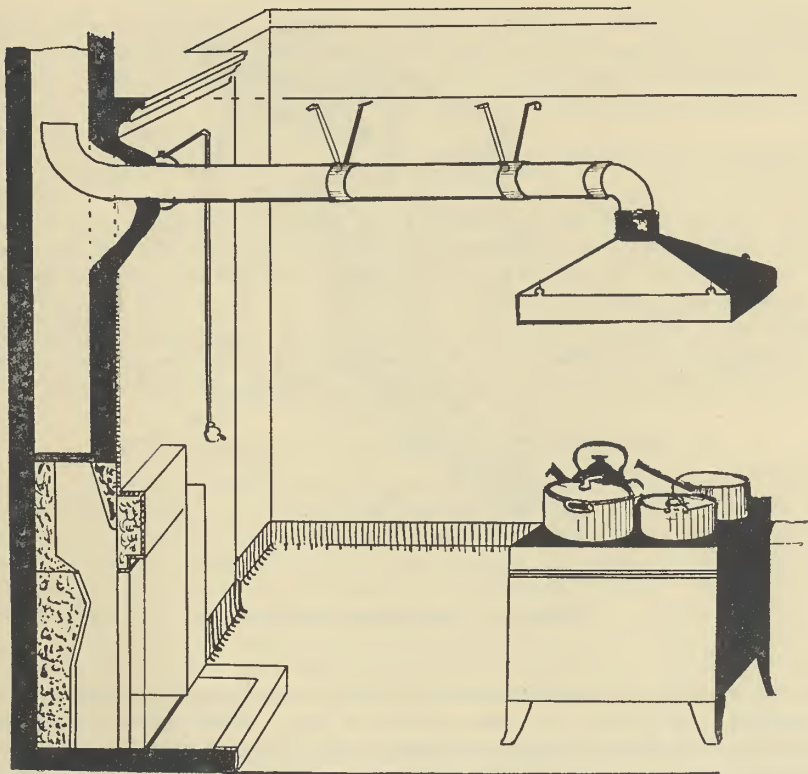


Figure III Ventilation System

into the existing chimney without a bend is valueless unless the rest of the chimney breast opening is effectively sealed off. The diagram shows how the exhaust pipes from a stove can be run into the flue at a distance from the chimney breast.

Wherever possible wet preparing and wet cooking units should be somewhere near an external wall in order to avoid long drainage channels in the kitchen. Ovens and stoves should stand on a good solid foundation, preferably one with a concrete base and a surface which can be easily cleaned. In the dry preparation zone of the kitchen there should be at least one deep sink with hot and cold running water. The potato peeler should be so placed as to discharge into a gully and should be fitted with an efficient strainer and trap for the waste (Figure IV). Mixing machines, which often have the bowls at knee level, should never be sited opposite doorways where dirt can be blown on to them, but should be efficiently screened. In the kitchen, or in a room off the kitchen, there should be storage space where the small items of equipment should have their individual places when not in use. Pots and pans should be stored on racks or slatted shelves, either upside down or on their sides. Carvers and fish-cutters—which should be reserved for their proper uses and thoroughly washed and dried after each use—are best kept in wooden sheaths.

The chef's larder should be close to the dry preparation zone, and should be cool, dry, shaded and well ventilated. It should be fitted with fly-proof doors, windows and ventilators.

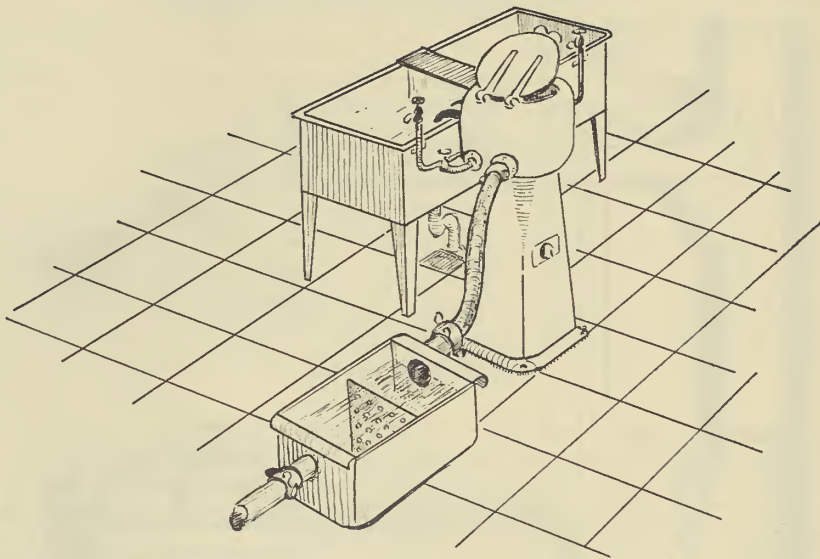


Figure IV Potato Peeler and Gulley

The refrigerator, although reasonably close to the kitchen, should be as far as possible from stoves and other sources of heat. Although the refrigerator is provided with thermal insulation to reduce the inflow of heat, it is economical to stand it in a cool place, where the refrigeration mechanism will have the least work to do. The refrigerator should not be boxed in, as some measure of ventilation is essential to the mechanism.

Washing-up Rooms. There should be two washing-up rooms or zones, one for the pan-wash (pot-wash, kitchen utensils, etc.) and one for the washing-up proper (crochery and cutlery used by customers). Pan-washing is a greasy job ; it is very difficult to get rid of all grease from the sinks and surroundings, and the washers themselves cannot avoid getting greasy hands and arms. It is therefore desirable to avoid any chance of the customers' crochery and utensils being washed in the pan-washing sinks, or stacked, before or after washing, with the cooking utensils ; it is also desirable for both the pan-washing and the washing-up to be done away from anywhere where food is being prepared or stored. Sinks used for washing utensils should not be used for the preparation of vegetables, meat or fish, or for hand-washing. For these reasons, the two washing-up places should be separated both from the other parts of the kitchen and from each other ; but, for ease in connecting the water and drainage, it is convenient for them to be fairly close together. One solution to the problem of keeping these places separate yet close together is to place the two sets of sinks on opposite sides of a dwarf wall (Figure V). Another solution is to put them in small rooms, next door to each other. A third is to mark the separation by gangways.

The crochery store should be readily accessible to both the kitchen and the dining-room. Plates, cups, saucers, dishes, basins and other crochery should be stored in clean, dry, cupboards (or in a separate room), protected from dust, insects and other sources of contamination. If plates are stored in drying racks, the racks should be clean, and the plates should be examined before use to make sure that they are clean. Plate racks should have drip trays

underneath, connected to a drain. Cups are best stored bottom upwards in wire trays. Stored thus, a cup will be picked up by the base or by the handle; if stored upright, it will probably be picked up by a finger inside the rim—an unhygienic practice. *Cutlery* should be stored in partitioned drawers or in partitioned covered boxes or trays.

The linen cupboard should be away from the kitchen and close to the dining-room.

The servery should be between the kitchen and the dining room. There should not be any intervening barriers, cupboards or rooms which would interfere with the forward flow of food from the kitchen to the serving points.

The Dining-room. It is important that there should be no risk of the food being contaminated on the way to the dining-room; the route should therefore be clean and well lit. It is desirable to have two doors to the dining-room, one leading in from the servery zone and one leading out to the washing-up place.

(b) Sanitary Accommodation and Cloakrooms

Sanitary accommodation must be provided for the staff and may be provided for customers. It is usually inconvenient for the same accommodation to be used both by staff and customers, except in quite small establishments. In larger establishments it is more satisfactory to combine the staff conveniences in a group with the staff washrooms and cloakrooms. It is important that the sanitary accommodation available to catering workers should be readily accessible. To reach it no worker should have to go out of doors or more than thirty yards from the room where he is working. Catering workers should never have to rely on the public conveniences provided by the local authority.

The compartment containing the sanitary convenience should be separated from any working room and from the dining room by an intervening ventilated space (Figure VI) and should be well lit; this last is most important as otherwise it will not be properly cleaned. There should be separate sanitary accommodation for each sex, with separate approaches. There are no regulations laying down the precise number of sanitary conveniences required for the staff of catering establishments, but the local authority will advise on what is suitable and sufficient in any particular case.

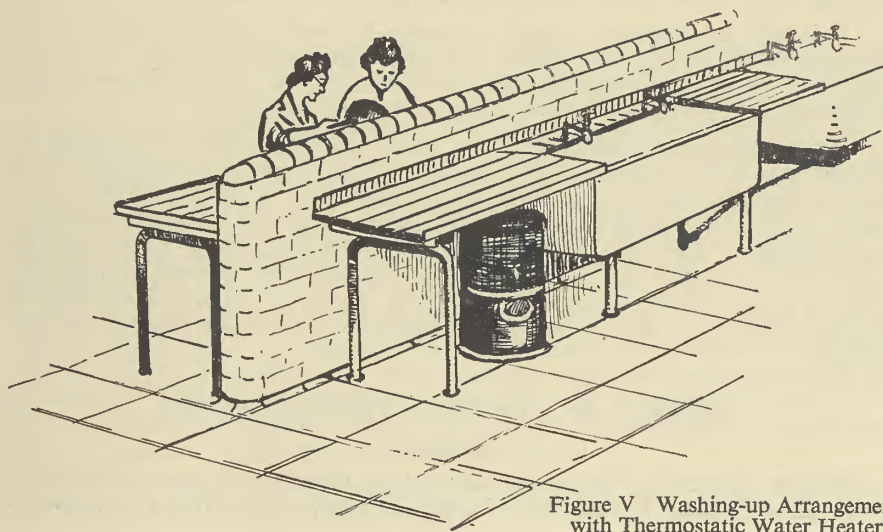


Figure V Washing-up Arrangements with Thermostatic Water Heater

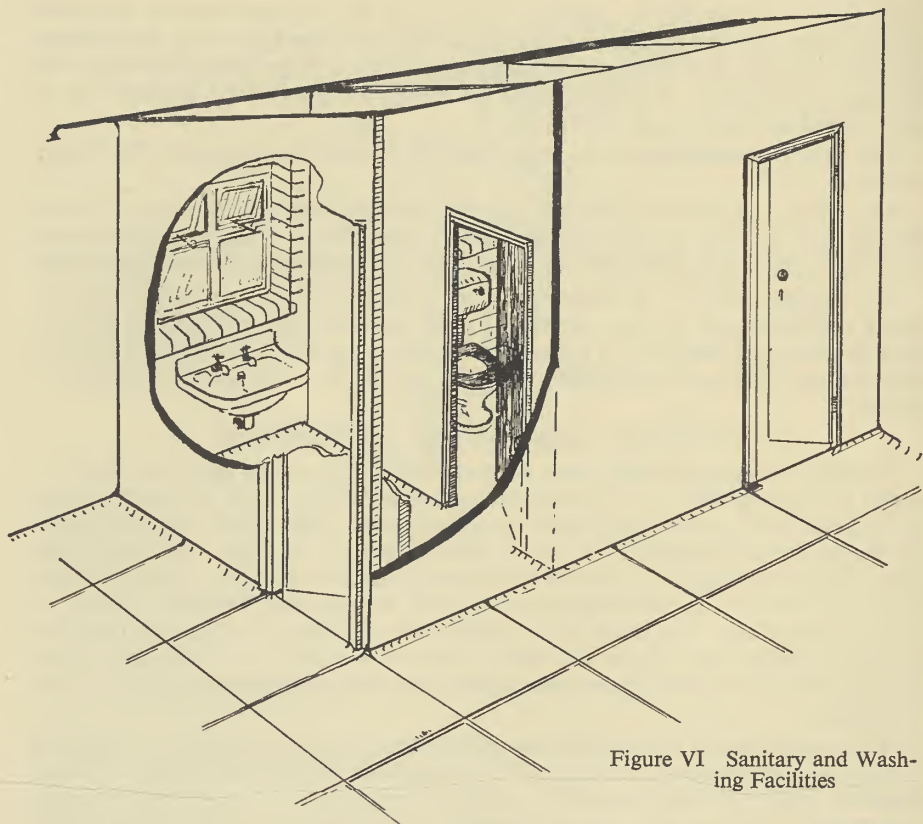


Figure VI Sanitary and Washing Facilities

There should be fully equipped wash-hand basins within compartments containing sanitary conveniences or close to them—for example, in the intervening space referred to above. The importance of washing the hands after using the sanitary convenience is stressed on page 28. For the reasons given on page 17 kitchen sinks should not be used for this purpose.

The basic requirements—ready accessibility, good light and proximity to washing facilities—can be fulfilled in many different ways; only after consideration of all the circumstances can a decision be made on whether the provision in a particular instance is suitable and sufficient.

Where there is no water supply or when a water-carriage sewage-disposal system cannot be used for other reasons—for example, at fair-grounds or at remote tourist centres—some form of chemical closet is to be preferred to an earth closet. Whichever type is used should be fitted with a cover or otherwise constructed so that the contents are protected from flies. Care must be exercised to see that the equipment is kept as clean as possible. It should be situated as far from the kitchen as reasonable, and it should have hand-washing facilities adjacent. It is never really impossible to provide water, soap and towels.

SECTION D. CONSTRUCTIONAL DETAILS

(a) Floors

Working Quarters. Floors in the working quarters of catering establishments have to stand a good deal of traffic as well as the weight of equipment

and are liable to have water and grease spilt on them. The essential requirements are that they should be even and impervious, without cracks or open joints ; smooth but not slippery ; hard wearing, and capable of being easily cleaned. The junctions with the walls should be coved for ease in cleaning. They should slope evenly towards the drainage outlets. A sufficient slope is a fall of one inch in every ten feet, from the highest point to the discharging point. If the floors are so large and the work done is of such a nature that hoses or electric floor washers will be used for cleaning, a trapped gully is essential. All floors must be kept clean and in good condition.

Among the most suitable materials for floors are terrazo, granolithic chips and kiln-fired quarry tiles. These should always be laid by experts in order to ensure the necessary fall and the preservation of an even surface. A properly laid terrazo or granolithic chip floor will stand wear and tear for a long time. When laid by inexperienced workmen, it is liable to crack, and thus to develop an uneven surface, pitted with dust-traps. Granolithic chips should be bedded in concrete and brought to a smooth surface like terrazo.

Quarry tiles are made in several qualities ; broadly speaking, the harder tiles are less absorbent but more slippery, and the softer tiles are more absorbent and less easy to keep clean. Tiles are now available with a slightly abrasive surface which prevents their becoming slippery. Light-coloured tiles are to be recommended because they look attractive, reflect light, and show up dirt. Quarry tiles are laid in cement, and it is important that the joints between the tiles should be complete and permanent. If these joints are not well made water will seep into them and will eventually find its way under the tiles ; the tiles will then begin to lift and the floor will need repair. When properly laid, quarry tiles form an impervious, hard-wearing surface which can be readily cleaned but which is not damaged by any of the cleaning materials used in canteens and kitchens. A well laid quarry tile floor may outlast the rest of the building.

A floor with large tiles, having fewer joints, is easier to keep clean than one with small tiles ; but large tiles, if broken, are more difficult to replace than small ones. A patterned floor of very small tiles is unlikely to be satisfactory ; it is difficult to lay small tiles to an entirely even surface ; the large number of joints increase the chances of dust-traps forming and hinder cleaning ; and the tiles tend to bulge and crack under pressure from the weight of free-standing equipment.

Ordinary concrete floors have the great disadvantage of being dusty and difficult to clean ; and the surfaces do not always stand up to continual scrubbing with cleansing agents. The surface disintegrates and cannot readily be patched ; the only effective repair is to cut out and relay a whole section of the floor. There are oil-based and sodium silicate preparations on the market which are said to render concrete floors dustproof, and these may be used with some success in premises where very little water or grease is spilt, but it is doubtful if they would be effective in busy kitchens. If concrete floors must be used they should be surface-treated with sodium silicate or dust preventative.

Magnesite composition floors absorb grease and water. Asphalte surfaces are liable to be spoilt by grease and oil and should accordingly not be cleaned with oil, spirits or turpentine. There are some asphaltic coverings which are greaseproof, durable under ordinary circumstances and easily cleaned ; but they tend to crumble into holes under the weight of heavy free-standing equipment. The same applies to floors of pitch mastic.

A surface of good cork linoleum or rubber above a tightly fitting hard-wood floor laid on to direct foundations (that is, with no air-space between the floor

and its bedding), set in bitumen on a cement base, will withstand frequent careful scrubbing and mopping and will last for years if looked after in the manner it deserves. A wooden floor can be used as a base for tiles if expanded metal reinforcement is laid over the boards. Ordinary printed linoleum should not be used as it wears very quickly and soon develops holes.

Uncovered hard-wood floors are satisfactory if they are efficiently laid and if they are properly maintained; they should not be scrubbed or polished; they should be wiped with a solution of equal parts of linseed oil and vinegar.

Soft-wood floors are unsuitable for the working parts of catering establishments; they will not withstand for long either the weight of equipment or the constant traffic and cleaning which is essential in a kitchen. Such floors should never be laid down in new premises, and if they exist in premises which are being adapted, they should be taken up and replaced with something more suitable; if they are retained, it may presently become necessary to suspend business during repairs.

In general, the matter can be summed up by saying that the best type of flooring is one which offers a complete, unbroken surface. If this is not available, any jointed floor should have the joints most carefully made.

Dining-rooms. The type of floor and floor-covering must be largely dictated by the class of trade. Carpets and mats should be thoroughly and regularly cleaned—preferably by vacuum cleaner—both underneath and on top.

(b) Walls

The essential requirements are that the walls should be substantial, durable, smooth, impervious and washable. In order to prevent the accumulation of unnoticed dirt and to provide agreeable surroundings for the staff, they should be light-coloured. For ease in cleaning they should be rounded at the junctions with walls and ceilings. In the working premises the walls should be as free as possible from ledges, projections or ornamentations, all of which collect dust and make it more difficult to keep the premises clean; in the dining-rooms some ornament may be permissible, but modern taste and practical considerations alike favour simplicity.

Walls which are intended primarily as partitions and which carry little or no weight can be constructed economically on a basis of a stout wooden frame, faced with plaster-board, hardboard, or one of the wall-covering materials which have been developed in recent years. Particularly suitable where alterations are intended to be only semi-permanent are partition panels comprising sheet covering on a honeycombed core. This is easy to erect and is becoming widely used (Figure VII).

Such partition walls as are described above can be finished to a fine, hard, clean surface which will take all the normal wall finishes and is easily cleaned. They will support electric light fittings, but they are not suitable for bearing equipment which weighs more than a few pounds or which exerts any pull on the wall.

The best finish for walls in kitchens and wet preparation rooms is tiling. Tiles on walls, just as on floors, should be set evenly with strong impervious joints, so as to present as level and as easily cleaned a surface as possible. If only the lower part of the wall is tiled, the tiling should be coved at the top—that is to say finished with a tile rounded on the edge. Walls which are not tiled should be finished in plaster. Walls in catering establishments should never be lime-washed, since lime-washed walls will not stand frequent cleaning.

There are several kinds of distemper. Washable oil-bound distempers will not withstand regular washing unless they are left to harden for a few weeks after application. Washable oil-free distempers are sometimes more difficult

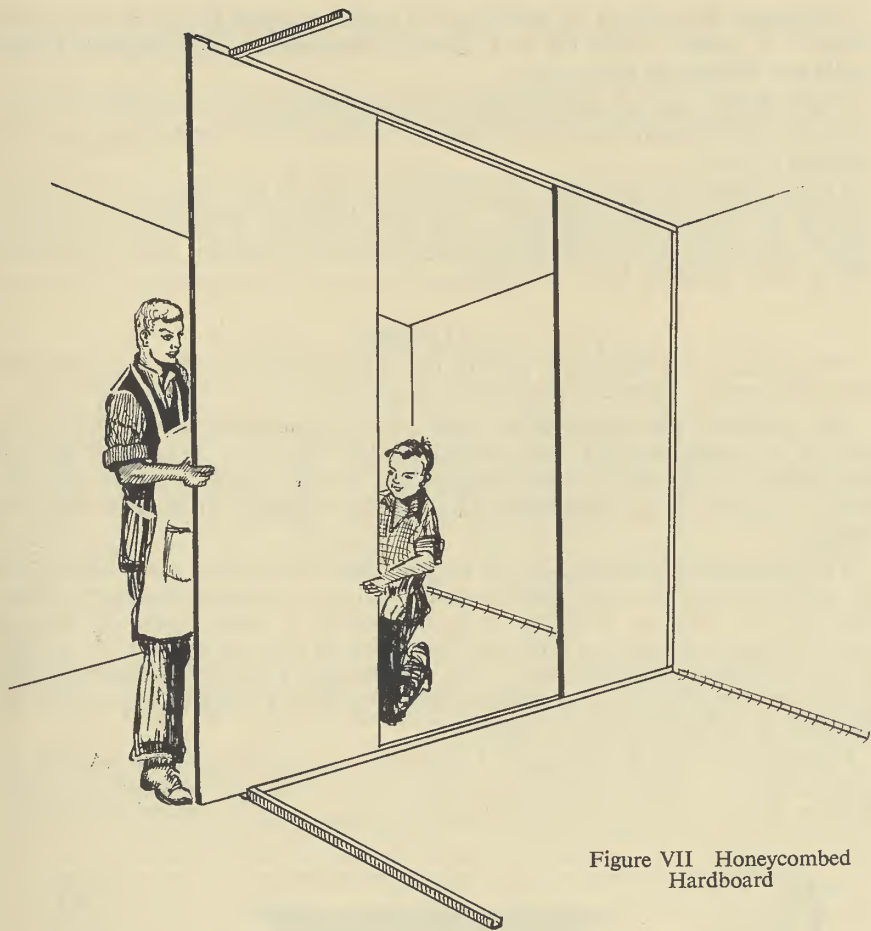


Figure VII Honeycombed
Hardboard

to apply than washable oil-bound distempers, but they are slightly more washable; they are resistant to alkalis. Non-washable distempers are not suitable for the walls of catering establishments because they cannot be cleaned, and rub off easily.

When kitchens with distempers walls are being redecorated, any grease marks on the walls should be heavily wiped over with turpentine to remove the grease on the top layer of the plaster, and the fouled area should then be painted over with good quality aluminium paint or knotting before redecoration is begun. If this is not done the grease marks will quickly work through the new distemper and spoil the redecoration.

There are now available liquid plastic decorative wall finishes which can be successfully applied directly by brush or spray to fair-faced concrete, to fair-faced brickwork, to partition walls, to plaster and cement, on top of creosoted or tarred surfaces, on top of wood, stone or galvanised iron. These are always quick drying. They can be applied directly over painted or distempers surfaces and, as they contain no oil, greasiness or saponification will not develop after application. They do not crack or discolour, and they withstand water and frequent scrubbing with acids; they are also resistant to alkalis.

Wallpaper should not be used on any walls in rooms in which food is prepared. It tends to peel off in a steamy atmosphere ; and papered kitchen walls are difficult to keep clean.

Paint, which can be cleaned easily, is suitable for the walls of the dry food store or the dining-room, but not for the kitchen, since steam condenses on a painted surface.

Glass panels for walls are now available, but so far they have been used mainly for decorative purposes. They are, however, suitable for wall areas which are liable to become particularly dirty (for example, above sinks) and which need frequent hard cleaning.

(c) Ceilings

The ceiling is an important part of the room and it must be kept clean and in good repair—free from cracks and flaking.

The essential requirements are that the ceiling should not harbour dirt, should be easily cleaned and should absorb moisture. This last is most important in kitchens and wet preparation rooms, where there is always a danger of food being contaminated by moisture dripping from non-absorbent ceilings.

The most suitable ceiling for the working parts of catering establishments is an under-drawn, plastered ceiling with a smooth continuous lower surface unbroken by beams. Ceilings of plaster-board or other forms of sheeting have the disadvantage that dust may collect in the joints or against the wooden or metal strips which cover them. The working parts of catering establishments should be free of cornices and decorations and there should be a coving at the junction of the ceiling and the walls.

Papered or painted ceilings in kitchens are as undesirable as papered or painted walls. Plaster ceilings "breathe" and so prevent condensation and the best finish is a soft, non-washable distemper. An absorbent colour-wash

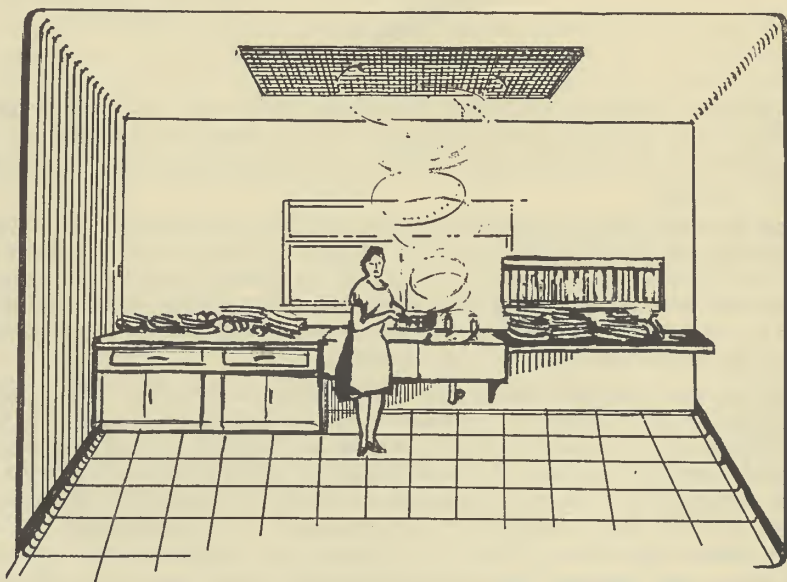


Figure VIII Cork Insets to Ceilings

of this kind should be washed off and renewed about once every six months—more often if necessary.

If the ceilings are not plastered, some arrangement to allow for absorption will be necessary. Cork insets can be let into the ceilings over steam-producing points (Figure VIII).

In converted premises, or in old premises which are being modernised, this problem of preventing the accumulation of condensation on ceilings requires expert attention, for in such premises it is not always possible to fit a canopy and exhaust fan over every steam producing point; it is thus all the more necessary that the ceiling should be absorbent.

(d) Doors, Stairs, Windows and Lifts

All joinery in the working premises, including door and window surrounds and fittings, and banister posts and rails, should be of simple design. It is preferable for door and window surrounds to be flush with the wall, but whether they are flush or not, the important thing is that the joints between the walls and surrounds, and any joints in the surrounds themselves, should be tight. Moulding, panelling and other ornamentation in such fittings collect dust and add to cleaning costs without providing any compensating advantages. Where tiles are met by woodwork, plaster or concrete, the joint between the tiles and the other material can be effectively sealed by a line of the cement used for setting the tiles.

Internal doors should be self-closing, but full-swing doors are liable to cause collisions. If the doors to and from the dining rooms are full-swing doors, they should either have transparent glass at eye level or else be strictly reserved for one-way traffic. Sliding doors are an advantage in places where doors are required to be kept open for any length of time, but the slots are liable to become dirty.

The size and placing of *windows* should be related to their purpose, and consideration should therefore be given to what this is to be. For ventilation they can be employed only with discrimination, and this aspect of their use is discussed in the next section. It is prudent to make the utmost possible use of windows for lighting, but windows cannot be relied on entirely.

Windows should be so sited that they can be cleaned both inside and outside without difficulty; and they should be cleaned on both sides at least once a week.

Service lifts are usually made of wood and are not easy to clean since the wood soaks up spilled liquids. It is worth while to line the wooden walls and shelves with plastic sheets or some similar covering. The walls of the lift shaft should be smooth and should be painted or distempered whether they can be seen or not. The insides and tops of lifts should be cleaned carefully every day. The haulage apparatus and the lift shaft should be cleaned thoroughly once a week. In this cleaning particular care should be taken to remove any food particles which may have fallen down the shaft. Such particles attract vermin. During cleaning a lookout should be kept for signs of rats and mice, which can readily get in through lifts. The lift doors should be kept tightly shut at both ends when the lift is not in use, particularly at night.

The lift should never be used as a food-preparation table or as a temporary food store. It should be divided horizontally into compartments so that soup, fish, main course, sweets, beverages, etc., travel separately, with liquid courses on the lower shelves. The attendant at each end should be provided with clean cloths to wipe up any spilled food immediately.

Large Lifts. When kitchens are situated above the ground floor, lifts used for bringing food up to the kitchen or for taking refuse away should not be used for other traffic. If, however, this cannot be avoided, food should not be carried along with other goods or passengers unless it is in closed containers : and if the same lift has to be used for both food and refuse it should be thoroughly cleaned both immediately after it has been used for refuse and immediately before it is used again for food. All lifts in which food or refuse is carried should be kept very clean.

(e) Ventilation

Adequate ventilation is essential in a kitchen. A hot, close and steamy atmosphere is not only unpleasant to work in, but also tends to promote the multiplication of dangerous germs in such "open" foodstuffs as soups, custards and made-up meat dishes. What is required, therefore, is a current of air sufficient to keep the room cool and to remove fumes and steam. The general flow should be either across the kitchen, or (where that is not possible) down the kitchen and away from the dining-room ; and the system should be so arranged as to leave no pockets of stagnant air.

Kitchens differ so greatly in size, shape, height, situation, lay-out and equipment that it is impossible to provide in this booklet anything more than a statement of the general principles of ventilating them. The problem of ventilation is essentially an individual one which can be solved only on the site ; and any caterer who is taking over new premises, or who wishes to improve the ventilation of his present premises, should call in an expert to make an examination and offer advice.

Natural ventilation is attractive because it is cheap. In many establishments it is quite satisfactory ; but it is not entirely costless, and it has some disadvantages which it is worth while to examine in detail.

Windows provide good natural ventilation only in certain kinds of weather, and only then if they are properly sited and if their opening is adjusted carefully according to the needs of the room as a whole and not erratically according to the whims of people who happen to be working near them. Window ventilation tends to be too boisterous in windy weather, unbearable in cold weather, and ineffective in very hot weather ; electric fans are therefore necessary to replace it in winter and to supplement it in summer. For proper ventilation, windows should be carefully sited in relation to the shafts of service lifts, the doors of ovens, and the room doors—particularly the service doors communicating with the dining-room, which will be constantly opening and shutting at rush hours ; this is often very difficult, and is sometimes impossible to arrange in adapted premises where the position of equipment has been dictated by the size and shape of the rooms and the positions of windows cannot be altered. Windows used for ventilation need to be insect-proof, since open windows afford an entrance to dust, dirt, flies and other insects. Unnetted open windows are particularly unsuitable for basement kitchens. In some situations, louvres or air-bricks are more suitable than windows, but they have size limitations ; and no form of natural ventilation can entirely keep out noxious odours and fumes from neighbouring undertakings. Despite these handicaps, a fair amount of use can be made of natural ventilation when the premises are above the ground floor ; but in ground floor, and especially in basement kitchens some form of artificial (mechanical) ventilation may be either necessary or, at least, desirable.

Artificial ventilation can be adapted to premises of any shape or size, and regulated according to the needs of the hour. The special problems arising from the presence of cooking apparatus make it advantageous for the ventilation of a kitchen to be self-contained and separate from that of the rest of the building.

In its simplest form artificial ventilation consists of an injector fan, fitted with a filter which excludes impure air, and an extractor fan at the other end of the room. It is desirable, but not essential, for the fans to be thermostatically controlled. Additional ventilation, particularly useful where there are fixed windows, can be obtained by the installation of the "flange" type of ventilator (Figure IX). High rooms are easier to ventilate than rooms with low ceilings. The vent outlets and inlets should be as high as possible on the walls. The inlets should not be near the coal chute, refuse dump, sanitary conveniences or any dirty or dusty places. If the fresh air inlets are inadequate in number or size the premises may become uncomfortably hot. The vent pipes in the kitchen should be fixed away from the walls so that they can be cleaned all round, and they should be painted to protect them from rust.

Although condensation on walls and ceilings can be reduced by the use of open-textured materials and finishes, the principal aim should be to remove fumes and steam from the kitchen at the point of emission. It is desirable that special cooking apparatus (*e.g.*, steamers, fish or potato fryers, grillers, ovens) should be fitted, wherever possible, with hoods to draw off the fumes, steam and intense heat, mechanically or otherwise. Before erection the hoods should be coated internally with Angus Smith solution to prevent rust. It is sometimes less costly, particularly where there is no general system of mechanical ventilation, to place cooking and washing-up apparatus against an outer wall so that the fumes can be extracted naturally; if this is done, the vent bends should not be acute and the outlet should be protected against the entry of foreign matter. If the kitchen is not on the top floor, outlet vents may have to be routed to the top of the building to avoid causing a nuisance to the other tenants.

In large basement kitchens, a lattice gate to the kitchen entrance may ensure a flow of air throughout the kitchen after working hours, but a lattice gate is undesirable where the outside air is dirty or where there are cats which may get through into the kitchen.

Both the vegetable store and the dry food store need to be systematically ventilated. The best way to keep these rooms airy and sweet is to have a ventilating brick at window level—9"×6" for a room of about 900 cubic feet, 9"×9" for a room between 900 and 2,000 cubic feet.

(f) Lighting and Lighting Equipment

Good lighting is essential in the kitchen and in all parts of the premises used for food storage and food preparation. This is required, not only in order that the workers can see clearly what they are doing, but also in order that dirt shall be evident and promptly cleared away. It is not sufficient for the premises to be generally light. There should be no gloomy corners or passages to collect unseen dirt. In most establishments, therefore, artificial lighting will be required to supplement natural lighting even during the day-time, but careful planning will reduce the expense of this to a minimum.

Light-coloured walls and ceilings reflect light and thus increase the amount of illumination; and, if the window area is equal to at least one-fifth of the floor area, most parts of the room will have daylight at some time of the day. If sinks and food preparation tables are placed near or under windows, natural lighting will normally be sufficient at these points during the day. Lights

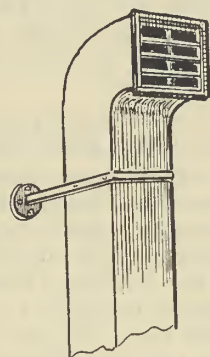


Figure IX Flange type Ventilator showing Vent Outlets.

should be placed so that the light spreads evenly and neither casts shadows nor shines in the eyes of the workers. A number of small points of illumination usually produce less glare than one large point. There should be lights in cold stores and food stores ; lights so placed as to give a clear view into the interiors of ovens and refrigerators and on to the working parts of machines ; lights over sinks and food preparation tables ; and perhaps also a movable spotlight to illuminate corners and spaces behind pillars and fixed equipment.

Fluorescent lighting has much to recommend it, particularly for kitchens, dining-rooms and places where a light is required continuously for a long time ; it provides a spread, shadowless light and produces very little glare. Although expensive to put in, it is cheap to run, and this system is usually found to be economical.

If ordinary electric light bulbs are used, they should be enclosed in white, translucent globes which completely cover the bulbs.

All electrical apparatus needs regular cleaning ; otherwise it harbours dirt and dust. Electric wires should be in protective pipes, and those pipes should either be chased into the wall or ceiling or so placed that they can be cleaned behind and do not harbour insects and dirt. The exposed parts of the apparatus in the kitchen—switches, bulb-holders, etc.—are necessarily subject to a wet, steamy atmosphere and they should be made of some plastic substance rather than brass, not only for the protection of the worker against electric shock but also because verdigris, which is formed when brass or copper corrodes, is poisonous.

Since the air in a kitchen may be very moist, it is desirable for the fuse box to be fixed in some accessible place outside the kitchen. Incidentally, it is a good idea to have fuse boxes fitted in duplicate, so that, if a fuse breaks, the supply can be switched over to the second box whilst the first fuse is being repaired.

Many caterers would be well advised to have their lighting systems examined and replanned by experts. The caterer who wishes to consider this matter for himself should know that illumination, as measured by an illumination-meter, is expressed in terms of foot-candle power, a foot-candle being the illumination received at one foot distance from a standard candle. No legal standards are laid down for the lighting of catering establishments in this country. The Illuminating Engineering Society has prepared a Code showing the recommended values of illumination for various types of work ; this Code suggests that catering establishments need from 6 to 10 foot-candles for cutting operations and from 10 to 15 foot-candles for mixing, blending, cleaning and confectionery-making. For work requiring closer examination of the materials or produce from 15 to 25 foot-candles is recommended.

(g) Water Supply and Hot Water Apparatus

Ample and immediately available supplies of both hot and cold running water are essential. Where the establishment occupies part of a building, it is desirable for it to have its own independent hot water supply. All water used for food preparation and cooking, for drinking, for washing-up, and for cleaning utensils and surfaces with which food or utensils may come in contact, should be public supply main water. Rain water, river water, well water and water from other non-purified sources should be used only for such outdoor purposes as washing down yards and swilling out dust-bins, except on the advice of the local health department.

It is not advisable to economise over water taps and piping. All sinks, wash-hand basins and other fixed receptacles should receive their water supplies direct from taps appropriately placed. For internal piping copper is best ;

and, where the course of the piping is not dictated either by the existing mains and tanks or by the siting of sinks and other appliances, it is worth while to give some thought to its arrangement. Pipes tend to collect dust, and horizontal or sloping overhead pipes are not only difficult to clean but may also accumulate moisture which drips on to the food. Whenever possible, pipes should either be run outside the kitchen (for example, under the floor or above the ceiling) or else they should be chased into the wall. When they must come into the open, they should for preference run vertically rather than horizontally, bringing the water straight down to the tap from the overhead pipes or straight up from the supply beneath the floor. In any case, they should be held at least two or three inches away from the wall by pipe clips, so that they can be cleaned all round and do not create crevices in which insects or vermin may breed.

Hot water pipes should be lagged to conserve heat and so reduce the consumption of fuel, but they should never be coated with any substance outside the lagging—and particularly not with rat or mouse poison or sticky lime, since these may melt or loosen and fall on to food or food preparation tables.

Storage Tanks. It is customary for water storage tanks to be situated in the roof, where they are liable to become contaminated and where they are difficult to examine and to clean. From the point of view of hygiene it would be better if they were more accessible, but the paramount consideration here is necessarily the pressure of the supply. They should therefore be kept covered, examined regularly and cleaned out from time to time.

Hot Water. Many water heating systems produce water which, although hotter than the 110°-120°F. which is about the most that normal human hands can stand, is never as hot as the 170°F. necessary for the proper sterilizing rinse of crockery, cutlery and utensils. Such systems are satisfactory enough in smaller establishments which can carry out the sterilizing by steam or by water heated in a saucepan or kettle ; but they are inadequate in larger establishments which have a constant demand for washing-up water at 170°F. Such establishments should be careful to ensure that their systems can provide water at 170°F. whenever required ; this, of course, can be arranged without raising the temperature of the whole water supply to that level. Since the demand for hot water in catering establishments remains more or less constant throughout the year, the water heating system should be independent of the room heating system.

Drinking Water. The dining-room should have a tap supplying cold drinking water for customers. Any taps served by water which is *not* fit for drinking should be clearly marked to that effect.

Wash-Basins. Catering workers should be encouraged to wash their hands both after visiting the sanitary convenience and whenever necessary during the course of work. They should not use the kitchen sinks for this purpose as this may infect the sinks with germs which can later find their way on to food. Moreover, the sinks will usually not be free at the time when hands need to be washed. Accordingly, wash-hand basins with hot and cold water laid on, and with good lighting overhead, should be provided in or adjoining the kitchen, and also in immediate proximity to the sanitary conveniences. In a kitchen in which at most ten people are employed, one wash-hand basin in the kitchen would be sufficient ; in a large kitchen, the ideal arrangement is to have one wash-hand basin for each section (e.g., meat, fish, pastry and so on). (See also pages 6, 7, 26 and 28.)

Sinks

Sinks and draining boards should have a smooth, hard, even surface and are best constructed of porcelain-finished fireclay, non-corrosive metal (for example, stainless steel), vitreous enamel or plastic, with one-piece tops welded

to the sinks. Porcelain sinks are satisfactory if in good repair ; but wooden sinks and draining-boards harbour germs in the cracks and joints. It is sometimes argued that sinks made of teak are less liable than other sinks to cause breakages ; a thin-walled stainless steel sink is as good as a wooden sink in this respect—and is infinitely more hygienic. Aluminium sinks scratch easily, are not robust and are more difficult to keep clean.

Sinks used for washing-up should be small enough to ensure frequent replenishing with hot water but large enough to take the largest dishes comfortably. For washing pots and pans galvanised iron sinks are suitable.

It is desirable to have the sink fitted with a spray hose for washing down the sink and draining-boards, and with a removable strainer in the waste-pipe for trapping crumbs, tea-leaves, etc. A built-in but removable refuse container is also an advantage.

Waste pipe traps are now being made of a plastic material which is proof against acids and hot water. These are hygienic, because the interior is so smooth that there are no cracks or crevices to harbour dirt, and they are superior to the usual lead trap, particularly where choking through misuse is common, because they are very easily fitted, cleaned and removed. Fitting is by means of a central screw through the top and bottom flanges, which hold the trap to the sink with a close, water-tight fit ; the bottom outlet of the trap is slotted over the runaway pipe with a jubilee-type pipe-clip such as is used to hold radiator hose pipes in motor cars. If there is a blockage, the trap can be gently compressed by hand and any small foreign matter squeezed through into the waste pipe. If this fails to clear the obstruction, the complete trap can be removed—by loosening the jubilee clip and the two screws holding the flanges to the sink—cleaned and refitted in a few minutes (Figure X).

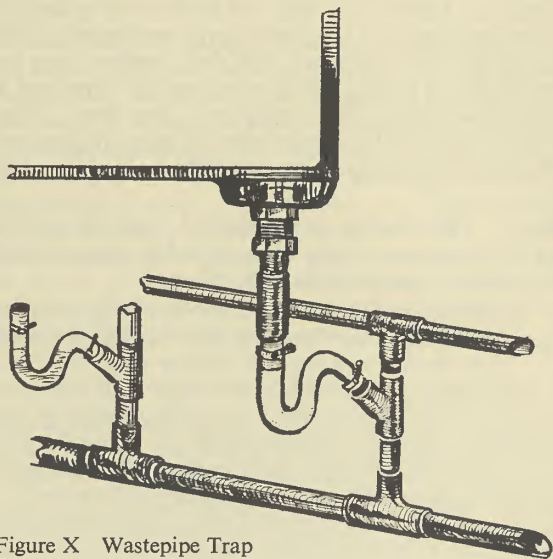


Figure X Wastepipe Trap

The number of sinks required will necessarily depend largely on the number and variety of the meals served. In general, it may be said that the vegetable preparation rooms will require at least two long deep sinks so that salad vegetables can be prepared separately from root or green vegetables for cooking. Fish should never be washed in the same sink as vegetables, and a

separate sink should therefore be reserved for fish. The meat preparation room also needs a separate sink. All these sinks should have hot and cold water laid on.

Washing-up (if done by hand) requires at least four sinks—two for the pan-wash and two for the crockery and cutlery. (Washing-up is considered in detail on pages 47-54.)

Drains

Drains should be adequate to remove all waste water without risk of flooding. Normal sized house drains are 4" in diameter. These are large enough to deal with a considerable flow of drainage and may be suitable for some catering establishments; but as certain types of equipment (e.g., cookers, potato-peelers, service counter equipment, cold stores) as well as sinks and dish-washing machines, require drainage it is possible that some catering establishments will need 6" drain pipes. All drainage, wherever installed, is subject to inspection and approval by the local authority, and the sanitary inspector must be consulted if it is thought that any alterations may be desirable.

There is nowadays an unfortunate tendency not to install grease traps. They are valuable because they prevent grease from congealing in the drain pipes. A satisfactory grease trap can be constructed quite simply by placing into a gully a small coke or breeze filter which is immersed in the water seal (Figure XI). The grease filter should be removed regularly and washed out, or the coke or breeze renewed and then replaced in the gully.

Many establishments have channelling covered with steel grids round the grease-producing areas. The tops of these grids and the channels themselves are likely to become muck-traps unless they are very regularly cleaned. They are difficult to clean, and Figure XII shows how such channelling can be dispensed with.

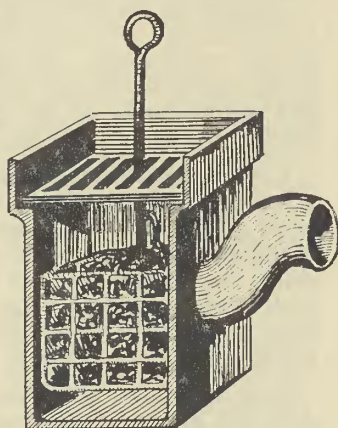


Figure XI Grease Trap

Sanitary Conveniences. (See pages 7, 8, 26 and 28.)

Remote Establishments. Wholesome water piped to indoor taps is not available in some villages, hamlets and isolated buildings in the country, and there are many small and remote catering establishments where the cost of installing a piped supply would be unwarranted by the amount of trade. Special precautions should be taken to see that the water consumed by the customers is wholesome: water used in cooking, pastry-making and preparing cold drinks should be boiled before use; the receptacles used for carrying and storing water should be scrupulously clean, covered to prevent con-

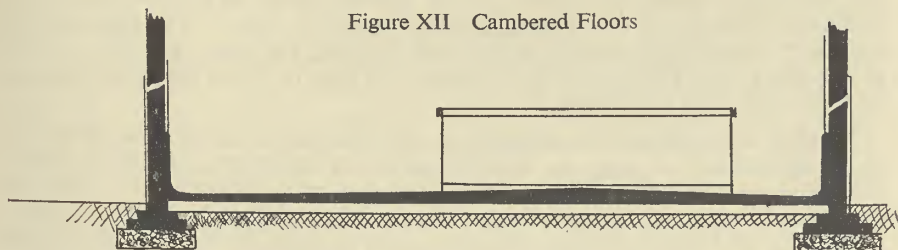


Figure XII Cambered Floors

tamination by insects or air-borne refuse, and frequently inspected ; the water used for washing-up and for cleaning cooking utensils and surfaces should be purified by the addition of a suitable chemical. The advice of the local health department should be sought on these and other measures appropriate to the particular circumstances.

(h) Rats, Mice and Insects

Measures for the protection of a catering establishment against rodents and insects are important because they considerably reduce the chances of food becoming infected and avoid the waste of food ; they save the caterer both trouble and money.

Rats and Mice

Rats and mice are dangerous sources of infection to man, and their presence should not be tolerated. Bacteriological investigation has shown that these animals are carriers of some of the food-poisoning germs ; it is possible, therefore, that any surface they touch may become contaminated.

The size of the rodent problem varies greatly from establishment to establishment, since it depends largely on the nature of the premises and the nature of the surroundings. It may well be that defence against invasion will have to be conducted outside the premises. In this, the co-operation of neighbours and the resources of the local authority should be enlisted. A number of commercial firms undertake to clear premises of rats or mice.

Large-scale attack by rats or mice, whether from inside or outside the premises, is often easier to defeat than that of a few casual invaders, because when rats or mice are present in force they can be promptly detected and their headquarters traced without much difficulty. Only continual vigilance can defeat the individual or the small colony. It is therefore necessary to exercise such vigilance, and it is important to take immediate offensive measures against even the smallest infestation. Only in this way can a small infestation be prevented from growing to a large one.

Rats and mice which enter a kitchen, through holes in the fabric, from defective drains, or through doorways, may not remain on the premises ; their living-quarters may be in the surrounding property. Mice or young rats brought on to the premises (for example, in sacks of flour) may stay and breed. Constant and careful watch must be maintained for indications of either kind of intrusion. All staff (and particularly the cleaners) should be instructed to report immediately any signs they may notice in the course of their normal work ; and it should also be the duty of a responsible person to make a systematic and regular examination of all those parts of the premises which do not come under frequent observation. This inspection should take in warm and dark corners, passages, stairs and the cupboards below them, meter cupboards, the shafts of service lifts, floor spaces beneath shelving and behind piles of stock in the food store, lofts and crevices or openings in walls and ceilings where pipes enter. It should extend outside the building, over the whole area under the control of the establishment, to include yards, out-buildings, waste ground and other possible breeding places. The signs to look for are : droppings, smears, holes and scrapes, runways, gnawing marks, grease marks on skirting-boards, footmarks in dust or moist earth and damage to food and food containers.

Whether the premises are infested or not, defensive measures should always be in operation. If they are infested, offensive measures should be added. Defensive measures should be aimed at rendering entry difficult and at reducing the attractiveness of the premises. The building should be kept in sound repair and all holes and other possible points of entry sealed up ; if rats still

get in, the drains should be examined. Rats and mice thrive where dirt is plentiful, where food and drink are accessible and where there are undisturbed places in which to sleep and breed ; therefore, the premises should be kept clean and all food protected. Food should not be left out over night but should be kept in receptacles with tightly-fitting covers. Stocks of food, particularly when contained in sacks or bags, should not be left undisturbed for any length of time, but should be shifted, examined and re-stacked at least once a month. Empty containers, particularly biscuit-tins, should be cleaned out thoroughly before they are put aside for collection or re-use. Food scraps, crumbs and food refuse—peelings, cores, husks, etc.—should be swept up at close of business each day and deposited in covered swill-tubs or rubbish-bins. So far as it comes under the caterer's control, the area outside the premises should be kept clean and free of material (for example, stacks of timber, piles of refuse) which might form a breeding-ground for rodents.

When premises are infested, the offensive must be taken and the rats and mice must be killed. There are two effective killers—traps and poisoned baits. Cats may act as a deterrent and may kill an occasional rat or mouse, but they cannot control large numbers.

Against *rats* in relatively small numbers traps are satisfactory. Traps should be placed close to a wall or stack on the rats' runway. Poison is the best method for killing rats, but care and skill is needed to select the right places for putting the bait—these are in holes or on runways where uneaten bait can be recovered and there is no danger of foodstuffs or utensils becoming contaminated. The bait should be well chopped up so that large pieces of poisoned food cannot be carried away. Generally speaking, it is advantageous to accustom rats to feed on the bait by putting it down unpoisoned, or on an unset trap, for a few nights.

Mice are generally more sporadic feeders than rats and are, therefore, more difficult to kill with poison ; breakback traps are more effective. Traps should be set on runways and at right angles to them at intervals, of about two feet.

Rodent poisons are dangerous to human beings. If supplies of poisons are kept on the premises, they should be clearly labelled as poison and kept away from human food. In no circumstances should a white powder (which can be mistaken for baking powder) or virus preparation be used on food premises. Some forms of virus are themselves active cultures of the food poisoning organisms. Arsenious oxide and antu, which are white powders, are mixed with distinguishing dyestuffs when used as rodent poisons.

Flies and Other Insects

Insects in catering establishments are objectionable for a number of reasons. Flies, bluebottles, cockroaches, steamflies and ants can carry germs from garbage or excrement to food and so cause food poisoning. Quite apart from this, the mere presence of insects in the premises is repugnant.

Flies develop from egg to adult in a week at midsummer. They should be fought both outside and inside the premises, and both by defensive and offensive measures. The yard should be kept clear of material attractive to flies ; garbage should not be allowed to accumulate ; rubbish bins and swill tubs should be kept tightly covered and regularly cleansed and hosed out. If neighbours are unwilling to co-operate effectively in the anti-fly campaign and the insect pest cannot be kept under control, the local authority should be consulted and notified of any manure heaps or refuse piles on adjacent premises.

Within the establishment food should be kept covered as much as possible, and all crumbs and food scraps should be disposed of promptly. Jugs containing milk or other liquid should be covered with butter muslin which should

be frequently boiled. Doors, windows, skylights and other openings to the outer air from kitchens, food stores and preparation rooms should be efficiently screened with a 16 mesh wire gauze, plastic cloth or perforated metal. Screen doors to the open air should open outward and be self-closing. Window screens should be removable so that the glass can be cleaned and the wood-work dusted. All screens should be regularly inspected to make sure that they are tight-fitting, clean and undamaged.

Flies are best controlled by the use of residual insecticides such as D.D.T. or B.H.C. The greatest care must be taken not to contaminate food or the surfaces with which it may come into contact. A 5% solution of D.D.T. or 0.5% gamma B.H.C. is effective against flies if sprayed over as wide a surface as possible (for example, walls, ceilings, lamp-brackets), but food should not be placed under treated lamp-brackets or ceilings, since flies may die in such places and fall into the food. This application should be repeated monthly, or whenever the treated surfaces are washed. Flies can also be killed rapidly by the use of knockdown sprays based on pyrethrum (which is harmless to man).

Cockroaches and other insects often inhabit narrow spaces and crevices behind piping and machinery, particularly when such spaces are warm and damp; therefore, when plant is installed, the creation of such centres for infestation should be avoided. Cockroaches are prevalent in old buildings and in buildings where the walls and floors are in poor condition. They should not be accepted as inevitable, and every attempt should be made to eradicate them. All crevices, including the entrance points of pipes and wires, which would offer them a good breeding place should be plugged. Powders, sprays, fumigants and traps can be tried. If the problem proves difficult, advice should be sought from an expert.

If all precautions against rodents and pests fail, the fault may lie with some careless employees, who habitually neglect to shut doors or replace the lids on dust bins and garbage bins. In the battle against kitchen pests, as in all other measures to secure clean food, the health and safety of the customer lie largely in the hands of the staff.

Chapter II. Equipment

It is not within the scope of this booklet to describe the various items of equipment used in catering establishments or to give instructions in their use. Such information can be readily obtained from the trade press and from the manufacturers. All that this chapter aims to do is to set out the general principles which, from the hygienic point of view, should underlie the purchase, installation and maintenance of equipment.

When buying equipment, the caterer, like every other trader, thinks first of purpose and price; he decides the needs of his business and he then buys equipment which appears to meet those needs and which he believes he can afford. Nevertheless in practice the final choice is often a matter of sentiment, habit or even laziness—the disinclination to look a little further for a rather better article. Within the limits dictated by usefulness and comparative price the decisive consideration should be hygiene—the ease or difficulty of keeping the machine scrupulously clean.

The cost of cleaning a machine cannot be precisely assessed in advance in terms of soap or detergent, or of man-hours; but what can be determined, by examining the designs of machines, the materials of which they are made, and

the principles on which they operate, is which would be easier to keep clean, and therefore both more hygienic and cheaper in the long run.

From the point of view of food hygiene the best machine to buy is the machine which is not only easy to clean but which can readily be examined to make sure that it is clean. If a machine is difficult to clean, only the most conscientious person will clean it properly ; and, if it is complicated in design or construction, even the most conscientious manager will be unable to find the time to examine it thoroughly and frequently in order to satisfy himself that it has been cleaned. No piece of equipment in a kitchen should give the cleaner either the encouragement or the excuse to scamp the operation of cleaning it.

The intending purchaser, therefore, should consider the ease with which a machine can be taken apart, cleaned and reassembled. If all parts which come into contact with food, or which may harbour dirt which could get into food, cannot be got at readily by a kitchen hand of ordinary intelligence and average mechanical ability, the equipment should have no place in a caterer's kitchen. Before purchasing any new piece of equipment the caterer should insist on being provided with precise instructions for dismantling, cleaning and reassembling.

This advice is not, of course, intended to apply to items of equipment (*e.g.*, electric motors and fans) which do not come into contact with food ; but it must be remembered that any fixed object in a kitchen may harbour dirt or dust (which may fall or blow into the food), and must therefore be kept clean. Motors and fans in bakehouses are often coated with flour and provide excellent examples of mould growth (Plate III). Unless motors are completely enclosed (as they are in most refrigerators) they should be of a type that can be cleaned, if not by a kitchen-hand, at least by a mechanic who is regularly and quickly available.

A prospective purchaser of equipment should remember that, from the hygienic point of view, the most efficient design is that which has the greatest areas of unbroken smooth surfaces, avoids ornamentation entirely, and has no unnecessary flange, ridge, projection, screw, serration, bulge, dent, crevice, internal corner or dust trap. The ornamental cast-iron stand, incorporating the maker's name or trade mark in an elaborate pattern of holes and flanged strips, or even the oven leg which consists of a flat piece of metal bent into an L-shape with an internal corner—hidden from sight to collect dust and spiders—should be rejected. Far too many items of equipment are still being made with unnecessary projections and crevices.

To a considerable extent, the design of a machine is dictated by the principles of its construction and operation. All moving and working parts require maintenance ; and, if they come into contact with the food, they require meticulous cleaning. Defects in design or construction (or the wearing away of parts) may lead to the addition of lubricating oil to the food—to the secretion of food particles (nourishment for thriving colonies of germs) in the interstices of screws, bolts and washers—and to the flaking into the food of slivers of soft and perhaps harmful metal. Machines incorporating brushes should be so planned that the brushes are automatically and efficiently cleaned during operation. All machines in which a rotating shaft is inserted through a surface with which food or drink comes into contact should have a close-fitting joint between the moving and the stationary surfaces.

The material used in the construction of equipment deserves consideration. It should be so chosen that the food with which it comes into contact will not be liable to contamination. Enamel should not be used for acid liquids ; galvanising is liable to corrode and may possibly contaminate food with zinc.

Tinned vessels are satisfactory when the tinning is adequate, but the film may be disturbed by heating or by wear. On the other hand, porcelain enamels (and some stoneware finishes) will withstand scrubbing better than stainless steel will; stainless steel can, however, be washed and swabbed easily and efficiently.

Machinery and fixed equipment should be so sited in the kitchen that not only can it be got at for cleaning but that the adjacent walls and floors can also be easily cleaned. If an article stands on legs, the legs must be long enough, not only to allow a broom to reach underneath, but also to enable the floor to be readily inspected for cleanliness.

All machinery and equipment should be maintained at a high level of efficiency. All mechanical plant (refrigerators, washing-up machines, etc.) should be serviced regularly. A record should be kept of the dates and details of such servicing. Utensils and items of equipment which are chipped, cracked, corroded or otherwise in a condition to harbour dirt or germs should be discarded.

Apart altogether from its cleaning, the ease with which a piece of equipment can be handled or operated has an important indirect bearing on hygiene. Most measures of kitchen hygiene demand a little extra care and trouble from the staff; a tired or exasperated operative will be reluctant to make the effort. Equipment which is heavy or clumsy, with handles which are hard or stiff to turn, doors which do not open readily, shelves that are uncomfortably high or low—anything which compels constant bending, stretching, or lifting—tends to tire or to annoy and should be avoided.

The interiors of ovens are often difficult to clean. The ideal arrangement is a loose inner oven, which can be removed for cleaning. In default of this, the oven should be fitted with an interior light which comes on when the door is opened so that it is possible to see at a glance whether the interior is clean.

Special arrangements have to be made for fuelling apparatus which burns solid fuel or oil. Whenever possible, the fuelling should be completed before the cooking is begun. If refuelling is necessary during cooking, then the fuel container should be near the oven but should be well covered to prevent contaminating the food. The cleaning out of boilers and the removal of ash should be done outside cooking hours and before the floor is scrubbed. A point to look for in solid fuel appliances is the relation of the stoking door to the entrance for the food; if these are close together the food may become contaminated with fuel-dust.

Work-tables, counters and other furniture should, in general, be of simple design, free of crevices, cracks and corners in which dust may collect. The surface material will depend, to some extent, on the purpose for which it will be used. The main considerations are that the surface should be impervious to liquids and should be capable of being easily and thoroughly cleaned. Soft wood is unsatisfactory, as it absorbs moisture, is easily scratched and cut, cannot be readily cleaned, and allows the multiplication of germs. Seasoned hardwood provides a good surface for cutting (but any joints should be tight).

Linoleum is readily damaged and cut, but good quality linoleum is suitable for work-tables and counters on which no cutting is done. Enamelled surfaces, so long as these are not chipped, are good for all purposes except cutting. Stainless steel is unsuitable for use as a surface on which food is cut, but is excellent for draining boards. The newer plastic-type surfaces which cannot be scratched by abrasives and scrubbing brushes, and which will not burn, have considerable advantages, particularly for counters and cafe tables. For pastry preparation the best surface is marble.

The bottom shelves of counters should be at least twelve inches above the

floor, so that the floor can be swept underneath. Large work-tables which are too heavy to be lifted easily should be fitted with wheels or castors so that they can be moved when the floor is cleaned.

Utensils and tools. Suggestions about receptacles or utensils for particular foods are made on pages 33-46. In general, it should be stated that, with a few exceptions, all utensils and small items of equipment which touch food or drink should have a hard, impervious surface which is not easily worn away or corroded and should be free of breaks, cracks or open seams. Their design should be such as to make them easy to clean; they should not have crevices or corners in which food may lodge; and they should not be used unless they *are* clean. Utensils containing or plated with cadmium or lead ought not to be used.

Chapter III. Practices

SECTION A. WELFARE AND CONDUCT OF STAFF

Food poisoning does not just happen. It is always caused, and the cause is nearly always the act or negligence of a human being. Therefore, the greatest single factor in the serving of clean food in a catering establishment is the mental attitude of the people working there. Carefully planned lay-out and well designed equipment will do a great deal to reduce the dangers, but ultimately it is the human factor which counts for most, and the right mental attitude is most easily developed and maintained in good surroundings.

It is therefore essential that both managements and staffs should appreciate the importance of their function in the community and should be thoroughly imbued with the principles of food hygiene. There is a moral obligation to practice cleanliness attaching alike to the cooks and kitchen hands who prepare the food, to the waiters and waitresses who serve it, and to the washers-up and cleaners; and there is equally an obligation on the managements to provide their staffs with the facilities for practising food hygiene and the encouragement to use them. All persons engaged in the industry should attend such courses on food hygiene as are available, and should qualify for membership of such Clean Food Associations as admit individual members who have attended courses or passed examinations; they should train themselves in hygienic practices until these become automatic.

To a very large extent cleanliness results from habit. Some people cannot work in a dirty place—with dirty tools, and they will be clean, without instruction, because it is their nature to be clean. Such people—and only such people—should be employed in the catering industry. It is, however, inevitable that in an industry which is so large and so diverse, and which necessarily employs a good deal of casual or short-term labour, there will be a fairly large number of people who are not naturally uncomfortable in dirty surroundings and who will consequently carry out hygienic practices only because they have been instructed to do so. With such people the practice of hygiene calls for extra effort. It is the duty of managements to do all they can to encourage their staffs to take that extra trouble. The efficient lay-out of the premises—so that the workers are neither over-crowded nor compelled to carry food or utensils over long distances—proper ventilation, the provision of stools or chairs for cooks or kitchen hands engaged on tasks which can be performed sitting down, the siting of wash-hand basins close to the working points—all these tend to lessen fatigue, to produce an atmosphere free of hurry and strain, and therefore to encourage care and cleanliness.

Seats

Much of the work in the catering industry entails standing, but many food preparation jobs which are traditionally done standing could be done equally well sitting, and all catering workers have occasional opportunities in the course of their work when they could reasonably sit down. Caterers are recommended to provide seats for their staff, even when there is no legal obligation. There is nothing morally wrong in sitting to work and no virtue in standing for the sake of standing—though some employers, and employees, think there is. A tired worker will be disinclined to take the trouble that cleanliness requires; sitting down saves fatigue, lessens nerve-strain and increases resistance to illness.

It is worth while to give some thought to the type of seat. Since it is undesirable to clutter up a kitchen with furniture, folding wall seats, swing-out seats or stools which can be pushed under work tables when not in use, have much to recommend them; but when people are sitting for some time, back rests and foot rests add considerably to their comfort. The height of the seat in relation to the working surface is also important.

Staff Cloakrooms

All catering workers, and particularly cooks and those who prepare and serve food, should be clean in body, clothes and habits, taking a pride in the smartness of their personal appearance. Such smartness can only be expected, however, if proper facilities are provided for changing clothes and for storing outdoor clothes during the day and working clothes at night. Clothes and other personal possessions should not be kept in the kitchen either regularly or occasionally. The ideal arrangement is a staff cloak-room, distinct from but preferably adjacent to the food preparation rooms, containing the sanitary conveniences and wash-basins and also individual lockers for clothes and other personal articles. Where both sexes are employed—and particularly where waiters or waitresses have to change into uniform—there should be separate changing rooms for each sex.

Clothes lockers are desirable because most people prefer to keep their outdoor clothes within sight of their work places, unless they are satisfied that there is no risk of theft. A type of clothes locker used in some establishments, and much to be recommended, has lattice-work sides and front enabling wet outdoor clothes to be dried by the normal ventilation of the room; it also has a shelf for handbags, hats, shoes, newspapers, books, parcels and other personal possessions.

Wash-hand basins should be installed on the basis of not less than one for every ten employees, and it is important that hot water should be laid on.

Towels for common use are undesirable and no such towel should be left in use once it has become dirty, or, in any case, used for more than one day without being laundered. If personal towels are provided, they should be laundered at least once a week. In larger establishments hot-air dryers or encased roller towels with a fresh section for each user may be more economical than individual towels; and liquid soap will be found to be a convenient and, in some respects, economical alternative to tablet soap. Another form of soap suitable for communal washing places is sold as a semi-liquid, with the same consistency as toothpaste, and delivered to the washer through a nozzle from a bulk container. Nail-brushes are essential and should be kept thoroughly clean.

A useful adjunct to a staff rest or first aid room is an automatic gas or electric toilet and hospital incinerator which quickly and completely destroys soiled sanitary towels, surgical dressings, etc.

Provision should be made for staff meals but, in default of a separate dining room, the nature of the provision must vary with the circumstances. The staff should certainly not have to eat in the kitchen, and it is usually considered undesirable for staff to eat in the public dining rooms when the public is present. The nature, location and furnishing of the staff rest rooms must determine whether they can be used for staff meals.

Protective Clothing

Protective clothing should always be worn while at work, and, since its purpose is as much to protect the food as to save wear on the clothes of the worker, it should be changed and washed frequently. For washing-up and for such vegetable preparation as potato peeling rubber aprons are desirable. Cooks and those engaged on preparing and serving food should have white or light-coloured overalls, large enough to ensure that the food will not come into contact with any clothes worn underneath.

Waiters should wear washable jackets and waitresses should wear light-coloured, washable dresses or overalls. Nylon overalls have the advantages that they can be washed at close of work, dried overnight, and need no ironing.

It is customary for cooks to wear white caps, but it does not appear to be generally realised that the cap is intended to protect the food from contamination by the hair as well as to protect the hair and scalp from the effects of steamy heat, fat vapours and flour. All cooks and persons engaged on food preparation should wear a washable head-covering so adjusted as to prevent hairs from falling into the food. A fine mesh turban type muslin hair-covering can be both attractive and hygienic. Hair should never be combed or tidied in a room where food is being prepared.

Footwear

It is important to pay attention to footwear. People who are constantly on their feet need to learn how to stand and walk with minimum fatigue ; for this they should wear comfortable and good shoes or boots which permit the body weight to be distributed, which support the arch and ankle, and which protect the foot from casual bruising against furniture or from falling trays or utensils. Moderate or flat heels are usually most suitable ; sandals do not give sufficient support for hard wear. Certainly no shoes should be worn after the heel has twisted over.

Germs and the Hands

The health of catering workers is dealt with in the next section, and here the concern is only with people who are in good health. Even healthy people carry around with them—principally in the nose, throat, skin, bowels and bladder—some germs of the types which can be responsible for food poisoning and other diseases. Food handlers must therefore take every precaution to ensure that such germs are not passed on to the food. An obvious precaution is not to cough or sneeze over food, and not to shake a handkerchief near it. A less obvious precaution—but one in which catering workers should train themselves—is to avoid touching the lips or nose. Nose-rubbing and finger-licking are objectionable at any time, and wiping the hands on the apron should be avoided.

The principal danger, of course, comes from the hands. All catering workers must realise that in their hands lie the health and well-being of the customers ; and they should endeavour to train themselves to the point at which they habitually shrink from touching food with their hands—touching it only by a conscious effort of will-power when it cannot be avoided. It is an advantage also if they can acquire a feeling of acute discomfort whenever their hands are unwashed. In most catering establishments there is a good

deal of unnecessary handling of food although a certain amount of handling is unavoidable. A cook is a craftsman, and food preparation is a craft in which some processes can only properly be performed by skilful fingers. It is therefore imperative that these fingers, and also the hands and forearms, should be meticulously clean. Nails should be kept short, well trimmed, and clean; dress rings and wrist-watches should not be worn at work. Food handlers should wash their hands and wrists (and, for some tasks, the forearms also) each time they enter the food preparation room or kitchen, and also frequently during the course of their work—particularly if they should happen to touch something unconnected with the job on hand. Such washing should be by the surgeons' method—plenty of hot water, soap and scrubbing with a nail brush. Disinfectants are unnecessary.

The most important single rule of food hygiene for all catering workers is: always wash your hands after visiting the sanitary convenience. This should be regarded by everyone as a necessary and well-mannered social custom. If this simple rule were universally followed, there would be a remarkable decrease in the spread of intestinal infections. Managements should encourage their staffs to obey it, both by providing fully-equipped wash-hand basins close to the conveniences and by placing "Please wash your hands" notices prominently in the conveniences. Toilet paper is porous, and germs tend to lurk under finger nails; therefore this essential handwashing may not be fully effective without the aid of hot water and a nail-brush. Frequent inspection should ensure that soap, nail-brushes and clean towels are available and that the notices are in position.

Posters on this and other aspects of food hygiene could, with advantage, be put up in suitable places in the working parts of catering establishments; if put up in kitchens, they should be pasted so firmly to the walls that they will not provide hiding places for dirt and insects.

Some managements carry out inspections at irregular intervals in order to make sure that hands are being kept clean; there is, however, a tendency for such supervision to be resented, and those who need it are probably unsatisfactory in other ways.

Smoking whilst preparing food is likely to lead to contamination of the food and for this reason is reprehensible. The danger here is largely an indirect one: smokers frequently (and often unconsciously) touch their lips in the act of smoking, and they are prone to cough. By either method they can transfer germs to food. The cigarette-end which finds its way into food is also dangerous, since it will have been in contact with the smoker's mouth. Few smokers can resist the desire to smoke if they are in the company of others who are smoking. It is therefore undesirable for anyone (managers and visitors included) to smoke in a room where food is being prepared, cooked or put out for service, and the caterer should post notices to that effect—worded as strongly as he considers expedient—in the working parts of the premises. For the same reason unauthorised persons should not be allowed in kitchens or other places where food is being prepared; and members of the staff should be discouraged from standing about in the kitchens when they are off duty and in their ordinary clothes. These people may wish to smoke, and if they do those on duty will smoke as well. If staff have reason to remain on the premises after working hours they should go to the rest room.

Use of Premises for Other Purposes. The working premises of catering establishments should not be used for other purposes, even after hours; they ought to be entirely separate from any residential quarters in the same building, and they certainly should not be used for sleeping or for the domestic washing or drying of clothes.

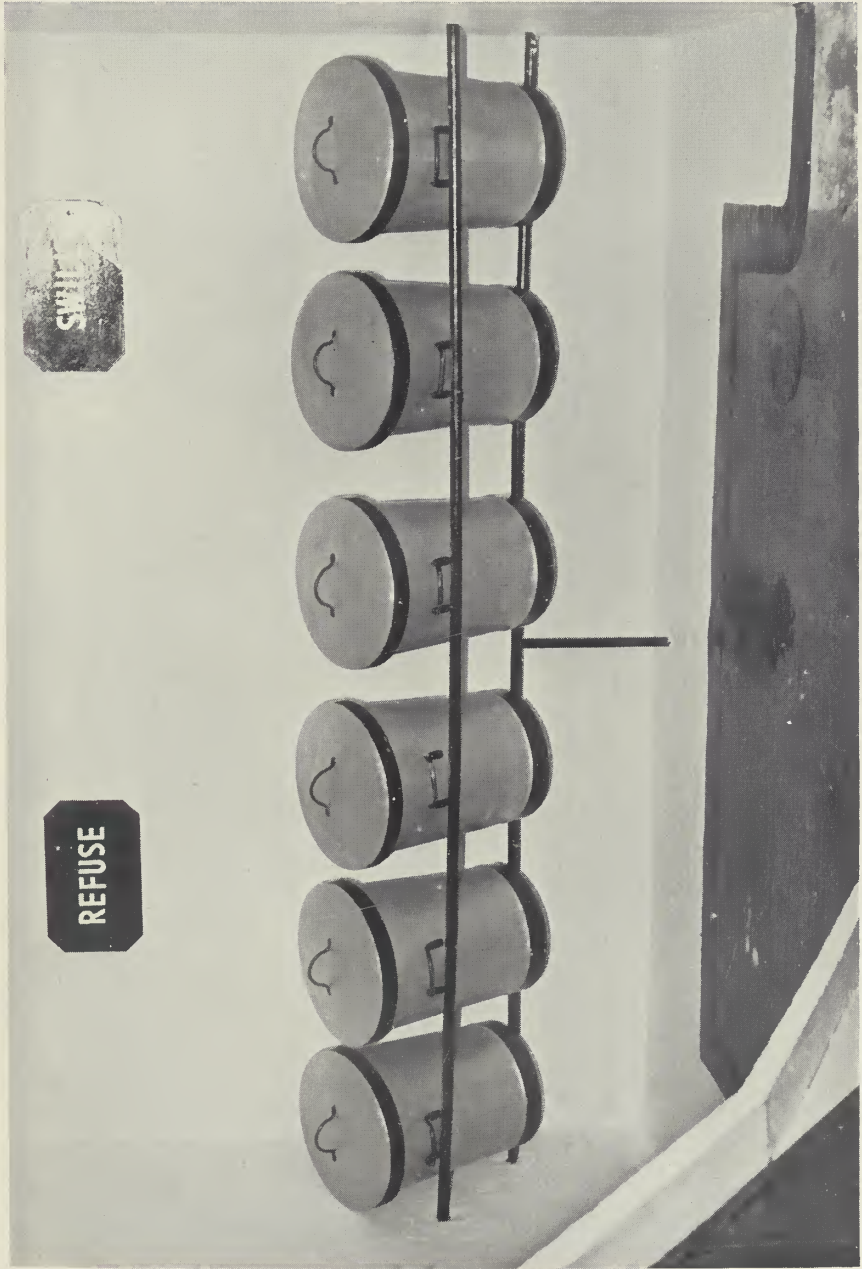


PLATE I. BACK YARD SHOWING RUBBISH AND SWILL BINS



PLATE II. DRY FOOD STORE



PLATE III. BAKEHOUSE MOTORS SHOWING MOULD

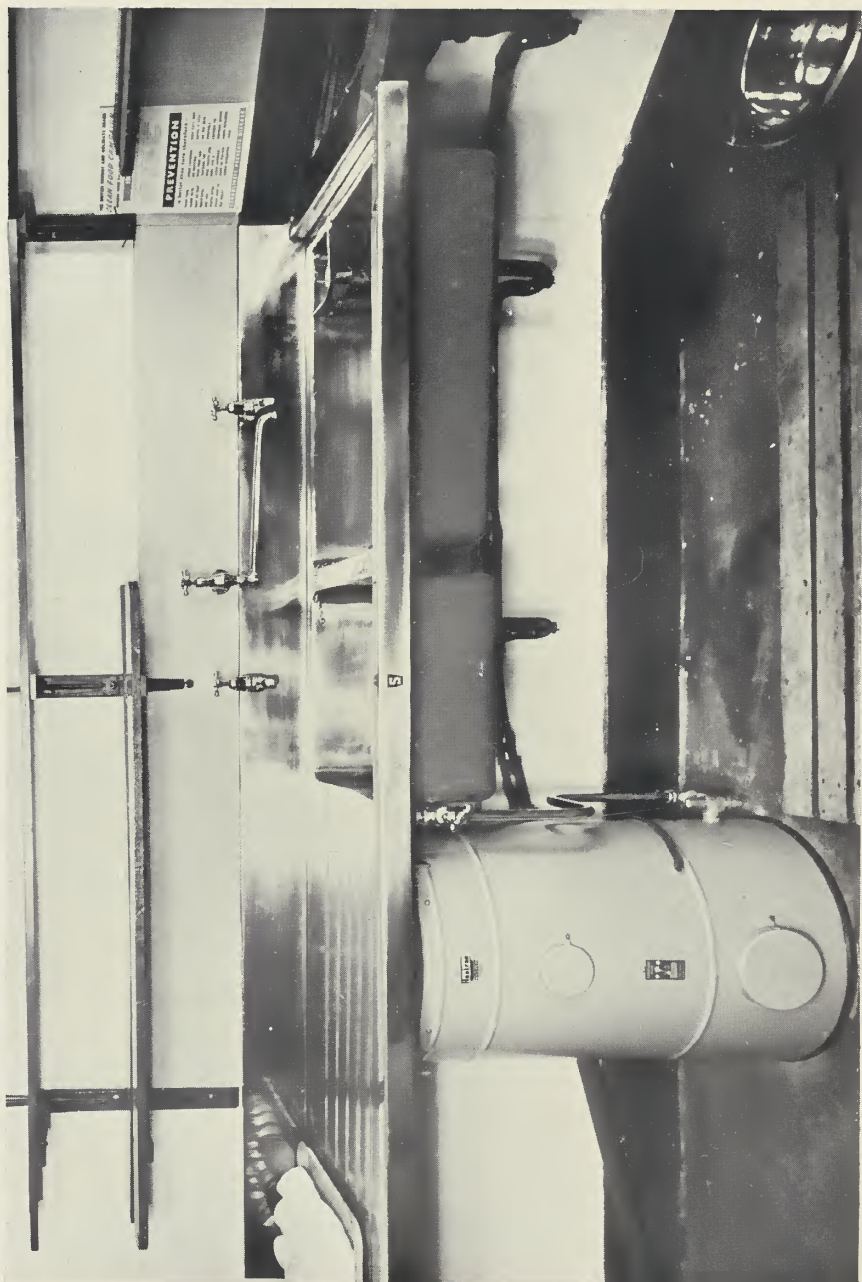


PLATE IV. WASHING-UP SINKS

Animals. Since live animals and birds often carry dangerous germs, they should be excluded from rooms where food is being prepared, cooked or served, and if they are allowed in at other times, they should not have the slightest chance of access to any food stored there. No animal or bird, domestic or otherwise, should be allowed to eat or drink from plates or any other vessels in which food is or may be prepared or served for human consumption.

Indiscriminate Use of Equipment. Catering workers should be strongly discouraged from using utensils and equipment for purposes other than those for which they are intended. There should be sufficient equipment to make it unnecessary for any article to be used for more than one purpose ; for example, saucepans used for cooking food should not be used for boiling out dish-cloths ; mops and dish-cloths should not be used for general cleaning ; floor mops should not be rinsed in kitchen sinks.

SECTION B. HEALTH OF STAFF

Purely medical matters are outside the scope of this booklet, but the health of the catering worker is important to the customer because a sick worker may be a source of infection to food, and being unfit, is less likely to take proper care in handling food. Those whose medical history makes their presence in the food trades a possible menace to public health should seek their livelihood elsewhere, and the caterer should take all reasonable steps to ensure that he does not employ them.

People suffering from an infectious disease ought not to be working in catering establishments. The chance of this happening is not very great ; the principal danger comes from people who are as yet in the early stages of illness or who are not ill at all but are carriers of harmful germs which may seriously contaminate food or utensils. Persons who have suffered from typhoid, paratyphoid, dysentery or food poisoning may continue to carry the germs of these diseases and therefore should not work in the catering industry unless they have been declared free from infection. The caterer is well justified in asking prospective employees whether they have suffered from any of these diseases.

But this is not enough. Mankind is subject to many ailments which depress but which do not incapacitate, and most people consider that it is unnecessary, and indeed unreasonable, to stay away from work if they are suffering from one of them. But the special responsibilities of the catering worker make it necessary for him to take up a somewhat different attitude. Certainly no person who is suffering from a discharging wound, sores on the hands or arms, discharging ears, or from attacks of diarrhoea or vomiting should be handling food which other people will eat or handling utensils which other people will use in eating. The management should have full regard to the danger of communicable infection, should explain the danger to the staff and should insist that it is guarded against.

A caterer cannot always tell from his own observation that an employee is unfit to be handling food, and he should ask his staff to report bowel disorders, digestive upsets and skin infections. The degree of candour necessary for the full protection of the public is more readily obtained if such confidences can be made either to a welfare officer or to a reliable person of the same sex as the employee. To send a worker home or to transfer him temporarily to another job disorganises routine and may raise other problems, but the caterer must face them, because he has a very special responsibility to the public which he must not neglect.

Catering workers should be particular about their teeth and gums, since an unhealthy mouth will harbour many germs which are readily transferred to

the hands and thence to food or to a utensil ; twice a year is not too often to visit a dentist for a routine examination.

SECTION C. ENGAGEMENT OF STAFF AND ALLOCATION OF DUTIES

When engaging staff who claim to have some experience in the catering industry, a caterer would find it worth while to ascertain what knowledge they have of food hygiene. Anyone who has worked in the industry for any length of time and who does not possess some knowledge of the principles and practices of food hygiene is unlikely to be a satisfactory employee from the hygiene point of view—or, indeed, from most other points of view.

When advertising for managers or senior staff, it would be desirable to include knowledge of the principles of food hygiene amongst the qualifications required. The subject of personal and kitchen hygiene is included in the syllabuses of many of the catering courses being offered, and short courses specifically related to hygiene for food handlers might be arranged by local education authorities and colleges in any area where a strong demand for such courses exists and makes itself felt.

From the point of view of hygiene, as well as that of general efficiency, it is desirable to have duties allocated precisely among the staff. It should be the responsibility of a designated individual to examine all food delivered to the establishment and to take appropriate action if it is unsuitable for its intended purpose. The washing and putting away of utensils and the cleaning of equipment and premises are duties which must be clearly assigned to individuals ; there must never be the slightest doubt as to whose duty it is to clean each item. There must, moreover, be a system of understudying to ensure that cleaning is carried out in the absence of the person primarily responsible ; and a system of supervision of the whole.

SECTION D. ACCIDENTS AND THEIR PREVENTION

The motto of this section is : “ I didn't think—”

A section on the prevention of accidents is appropriate to a booklet on food hygiene for three reasons :—

- firstly, minor accidents result in cuts and abrasions which may be a source of infection to the food ;
- secondly, major accidents result in absences and thus upset routine ; and this may lead to the temporary neglect of such hygienic precautions as the proper cleaning of utensils and equipment ;
- thirdly, workers in an establishment where the lay-out and equipment have been designed to be as accident-proof as possible will not have to concentrate all their attention on avoiding accidents and will be able to spare time and thought for the claims of hygiene.

All catering establishments should be equipped with efficient and accessible fire-fighting apparatus and with an adequate first-aid kit. Restaurants and canteens attached to department stores and factories usually have the services of a proper first-aid room with a full-time staff, but most caterers will find a carefully stocked first-aid box or cupboard sufficient. At least one trained first-aiders should be available whenever staff are on duty in the kitchen. The most convenient place for the first-aid outfit is usually the staff rest-room or cloakroom ; the names of the trained first-aiders on the staff should be posted up nearby.

Any accidental cut or scald should be immediately covered with a protective water-proof plaster ; otherwise, the place may become infected and the infecting organisms transferred to communal towels, kitchen utensils, equipment, or direct to food in course of preparation. Incidentally, first-aiders should wash their hands after treating even slight injuries.

Many accidents occur because people are excited or in a hurry. The difference between quick, skilful craftsmanship and hasty, careless bungling is usually obvious in its results. Catering workers should never be in too much of a hurry to do the job in the proper way. Sometimes, of course, an operative has to work hurriedly because the kitchen—perhaps only temporarily—is understaffed ; but hurry and excitement frequently arise as a result of poor lay-out, bad ventilation, unsafe flooring, inadequate or remote sanitary accommodation, overcrowding, and neglect (perhaps involuntary) by the management to plan and equip the kitchen efficiently. Hurry also arises because the work has not been planned. Cooks should work to a time-table.

Almost all accidents in kitchens are caused by human action, or lack of action, and could have been avoided by the exercise of care or foresight. Not everybody is suited to be a catering worker. Some unfortunate people are accident prone, but others have accidents thrust on them. The scatter-brained person who is for ever putting obstructions on the floor for other people to fall over should seek employment in a circus rather than a kitchen.

The majority of accidents in kitchens can be classified under three headings : falls and collisions ; burns and scalds ; cuts and abrasions.

Falls and collisions sometimes occur as a result of insufficient lighting or faulty lay-out. Floors should not be uneven or slippery ; doors should be self-closing, with transparent glazing at eye level ; steps should be wide and shallow ; ramps or slopes are preferable to single steps ; there should be no blind or narrow corners at traffic lines ; open floor channels should not be sited where operatives are likely to have to stand. For some accidents under this heading, the victims or their colleagues are themselves to blame ; such accidents arise because passages and traffic lines have not been kept clear of obstructions, because spilt food or liquid has not been wiped up and a slippery patch has developed, because an extempore erection of boxes has been used, instead of a ladder, to reach a high cupboard. Falls also result from climbing a ladder without a free hand to grasp the guard rail and from wearing shoes with slippery soles or very high heels. Another cause of falls, for which the management is usually to blame, is the loose, broken or missing gully grid.

The kind of wound usually produced by falls and collisions is also produced by banging the head against an open cupboard door, by bending to pick something off the floor and hitting the head on a shelf or table when rising, and by dropping heavy objects on the feet.

Burns and scalds may arise from accidental fires. All cooking appliances should be stood on non-combustible bases. Such bases should be not less than two inches thick and should extend not less than two inches beyond the planes of the sides of the appliance. If this is not possible, the appliances should be so designed as to prevent the floor temperature reaching 150°F. Where combustible material is within nine inches of cooking apparatus or vents connected to them, provision should be made to keep the temperature of such material below 150°F. when the appliances are maintained at their maximum working temperature.

Scalds often result from steam escaping through defective valves and joints, and scalded feet are often caused by loose cocks to tea urns or boiling pans. If the condenser pipes of wet steam ovens are not kept free, water accumulates in the oven, and the cook who opens the door and looks in is scalded in the

face. Experienced cooks usually stand behind the door when they open the oven. Experienced cooks, moreover, use dry cloths to handle hot utensils ; wet or damp cloths transmit the heat and may cause burns.

Cooks occasionally scald themselves by touching the hot top of the stove, or by overturning a vessel full of boiling liquid, but this type of accident most commonly occurs not to the cook but to someone who has no business to be near the stove. Hot fat causes many fires and a considerable number of burns. If the deep-fat frying-pan is more than about two thirds full it may spill out on to the range, and if hot fat is mixed with a cold liquid it will splutter dangerously.

Cuts and abrasions sometimes result from unfenced machinery or from machinery which is badly sited—too close to other equipment or to traffic lines. Many of the machines used in catering kitchens, however, are of such a nature that their knives and blades cannot be completely protected without rendering them ineffective for their purpose ; and accidents resulting from the improper use of mincing, mixing, slicing, bread-cutting and bacon-cutting machines are very common. It is a duty of the responsible person in a kitchen to take all possible steps to prevent accidents and to impress on the workers the need for care in using kitchen machinery and equipment. Even so, many accidents result from carelessness and from failure to obey the manufacturer's instructions ; many a kitchen hand has paid a finger as the price of his contempt for the dangers of a machine he was over-familiar with ; and many surprised operatives have wounded themselves by meddling with machines they did not understand.

It is sound practice to restrict the use of particular machines to certain skilled operators and to make them responsible for seeing that the machines are kept clean and in proper running order. When a machine is available to everyone, it becomes the responsibility of no one ; and machines which are not cared for, like unloved children, are liable to turn savage. Certainly, no one should be allowed to use a machine which has dangerous potentialities until both its working and the safety precautions have been fully explained and understood. If the manufacturer supplies a printed card of instructions, that should be hung close to the machine.

Each make of machine has its own peculiarities, and this booklet cannot describe all the accidents which may happen with each type. Examples of accident-producing practices are :

operating a slicing machine without adjusting the safety devices or without sheltering behind the safety guards ; changing the beaters on a mixing machine without switching off the motor ; and feeding or attempting to free a mincing machine with the fingers.

Butchers sometimes cut themselves badly by resting the free hand in the striking area of the cleaver, or by not keeping the hand behind the knife when attempting to cut up meat which is insufficiently thawed and therefore slippery.

An energetic attempt to force a saw may cause it to jump and tear the hand used for steadying the carcase ; a tough crust in a pile of sandwiches may lead to a similar kind of accident. It is safer to place the index finger of the free hand on the back of the blade.

Carvers cut themselves by using a fork or a steel without a guard, or by dropping the knife and grabbing it by the blade. They cut other people by gesturing with the hand that holds the knife or by walking about with the point of the knife held outwards.

Washers-up cut themselves by grasping knife blades in soapy water, and the dryers-up cut themselves by picking up assorted handfuls of cutlery from the draining board. Impatient people who open tins with knives often cut

themselves when the knife slips ; and if they open a tin with the cleaver they leave jagged edges to cut someone else. There is a good deal to be said for putting the tin-opener back in its place after use or for using a type which is permanently secured to the wall.

Not only knives need careful handling. Over-enthusiastic cooks sometimes stab themselves, or their colleagues, with forks.

Cuts or abrasions sometimes result from cracking glassware or broken crockery—even from picking it up after a fall ; and some very ugly and painful jags in the hand can be obtained by impetuous efforts to open wired packing cases.

SECTION E. STORAGE OF FOOD AND USE OF THE REFRIGERATOR

The golden rule for storing food is : keep it clean ; keep it cool ; keep it covered.

The proper storage of food in a catering establishment calls for systematic and unremitting care on the part of both management and staff.

From the point of view of food hygiene, it is, of course, better not to keep any considerable stock of food, unless proper provision is made for it and for its supervision. It is better that food should remain, until use, in the possession of people whose business it is to hold large stocks in good condition. Almost all catering establishments do, in fact, keep some stocks of food, and many of them store bulk supplies for weeks or months. Such long storage, whether in large or small quantities, renders periodical inspection and turnover of the goods, and regular cleaning of the storerooms, imperative. Appropriate storage should be provided for all food, and the management should insist that it is properly used. Access to food stores should be restricted. No food should be kept in the kitchen, or in the larder, apart from what is required for use during the day ; and the manager, in his regular tour of inspection, should see that this rule is being observed.

The Dry Food Store (Plate II)

The siting, construction and lay-out of the dry food store is rarely given the consideration it deserves. It is important that this room should be dry, well lit, well ventilated, vermin-proof and clean ; and various means for attaining this are described on pages 4, 8-16, 20-22, 54-56.

Cupboards and cupboard shelving should be of simple design, without dust-collecting ornamentation and unnecessary ledges or panels. If the sides fit tight to the wall, a cupboard is better without a back. The doors of cupboards should be so designed as to enable the whole of the shelves to be clearly visible and accessible for cleaning when the doors are open.

The fixing and arranging of free shelving is a matter than can only be decided when due regard has been paid to the foodstuffs to be stored, but there are general principles which should always apply. Shelves should be constructed for their precise purpose and should not be ready-made or casually planned lengths put up in some empty space on the general idea that a few shelves will come in useful. They should be so fixed that they can be easily taken down and re-erected, in order that regular and thorough cleaning can be the rule rather than one spring clean or one major operation every few months. They should be narrow enough to enable all the goods on them to be easily accessible.

Wide wooden shelves should not be made of planks which are joined, tongued and grooved, but of $2" \times \frac{1}{2}"$ slats, laid with a clearance of $1\frac{1}{2}"$ to $2"$ between each. The slat nearest the wall should have a small return board

fixed on edge to form a lip which will prevent goods falling behind the shelves. The back of this lip should be at least 2" from the wall in order to leave room for cleaning the wall.

Where shelves on two walls meet at a corner, the corner should be rounded or blocked in to avoid an uncleanable dust trap (Figure XIII).

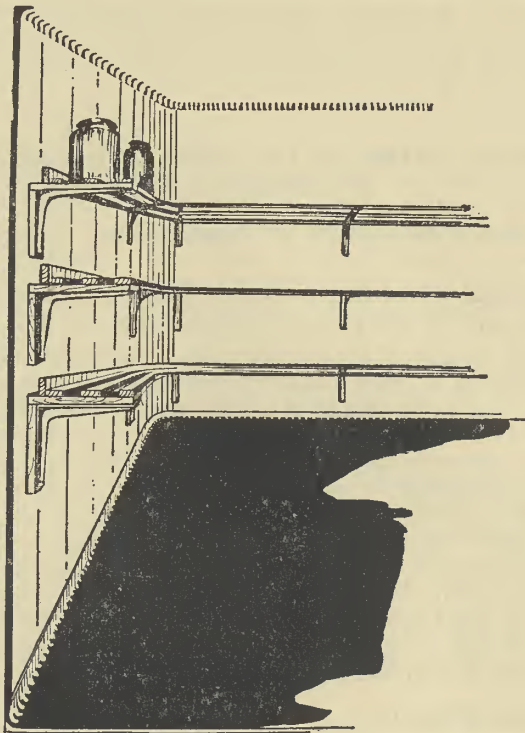


Figure XIII Shelving

Unless the store room is exceptionally well lit, it is undesirable to have shelves above windows. Special shelving—covered with marble, hard stone or tiles—should be set aside for such materials as fat ; and one section should be allocated for glass receptacles, which should neither be on the floor where they can be accidentally kicked and smashed nor on a shelf where they are liable to be knocked when other goods are being brought in or out of the store.

No foodstuffs, even when in bins, boxes or cartons, should be stored directly on the floor. Packages standing on the floor hide it from view and allow dirt to collect unsuspected. The bottom shelving should be about 2' 6" above the floor—sufficiently high to permit heavy goods to be stored on loose lattice duckboards below. The duckboards themselves should be high enough to allow the air to circulate at floor level and to keep the food at least six inches from the floor.

Containers for Food

The proper storage of food entails the provision of suitable containers. The nature of the foodstuff usually determines the nature of the receptacle

required, but, in general, the best container—particularly for partially prepared food and for food broken down from bulk—is one with an impervious cover which fits tightly.

All food containers, whether on duckboards or shelves, should stand clear of walls, especially outside walls. They should also be kept scrupulously clean, and (unless the articles they contain are naturally wet) completely dry, both outside and inside. Damp will destroy the stoutest containers in time, and when damp reaches food it will foster the development of mould. Mildewed, torn, sticky or dirty cartons, dirty, rusty tins or bins, and dirty boxes should, within reason, be discarded; at least, they should never be used without consideration of the nature both of the goods to be stored in them and of the goods to be stored alongside. For example, tinned goods may well be safe in a torn carton; and vegetables, which are usually dirty when they arrive, need not be put in a clean bin. Enamelled and galvanised receptacles which have been chipped on any surface likely to come into contact with food, should be withdrawn from any service in which food for human consumption may be contaminated by either chipping or rust. Such receptacles can, of course, still be used for rubbish, swill or packaged goods. The important thing is to remember that dirt and damp are enemies and that they should be kept as far away as possible. The careful management avoids any action or appearance which may encourage the staff to imagine that dirt is tolerated in the establishment.

Storage and Inspection of Food

Food should be stored in a systematic manner. It is convenient to segregate food which is to be used promptly from food which is to be held for some time, but such grouping must not be allowed to prevent either the regular examination of long-stored food and the frequent cleaning of the wall and floor surfaces it hides, or the usage of supplies in order of priority. Generally speaking, the earliest consignment should be used first, but this is not a hard and fast rule, since quality, condition and fitness for purpose are important considerations; the main thing is that the rule "First in, first out" should never be broken without good reason. Parcels of food must never be pushed into a corner and forgotten until they draw noisome attention to their presence.

All stocks which are being held for any length of time should be inspected once a week, and it should be the duty of a member of the staff to keep a stock list and to see that each item is ticked off as inspected at the appropriate time. It is useful to incorporate in the list a brief code to indicate condition. The manager should examine this list each week. Should this weekly inspection reveal any damaged goods or containers—for example, a burst bag—any food unfit for consumption should be destroyed immediately, and any fit for use should be promptly rehoused.

Keeping food clean does not mean merely keeping it free from visible dirt, although that is important; it is even more important to keep it in such a way as to prevent the multiplication of germs, since these germs are invisible, and their presence will pass undetected both by the cook and by the customer until, perhaps, the customer becomes ill. Most disease germs multiply best at about body temperature and in a moist atmosphere. Germs which spoil food develop best at room temperatures. High temperatures usually kill both kinds but freezing preserves them in suspended animation. It is for this reason that foodstuffs, in general, should be kept cool and dry; that perishable foods should be kept (according to their nature) in the larder (either in closed containers or adequately protected with muslin or wire covers) or in the refrigerator or cold room. Special precautions should be taken with milk and meat. (See the sections on the use of the refrigerator and the cooling of pre-cooked dishes, pages 38-43.)

Milk and Milk Products

Fresh milk, if received on the day it is to be used, should be stored in a cool room or at least in a cool place. Milk which is to be retained on the premises over night should be put into cold storage, preferably immediately on delivery; for this, some assessment of usage should be made at the time of delivery. Bottles should not be opened until the milk is about to be used. The tops and sides of milk bottles should be wiped with a clean cloth before the caps are removed.

Milk powder should not be reconstituted, nor condensed milk diluted, until required for use, and then only in the required quantities. If any has to be stored over night, it should be placed in the cold store in a covered container.

Butter (and other fats, including margarine) should normally be stored in the refrigerator, but small quantities held in the larder for use during the day should be stood (wrapped in greaseproof paper) on a marble or stone slab. Cheese keeps best in ventilated storage—for example, a cabinet with perforated metal sides—and should not be stored in the refrigerator. Whole or half cheese, particularly when new, and blue-veined, curd or cream cheese, should be turned over daily, and excessive moisture should be scraped or wiped off. Cheese should not be removed from its binding or wrapping, nor should it be cut, until it is required for use. Cheeses which have been creamed for spreading must be used the same day.

Milk, butter and cheese should be kept away from fruit, fish, oils, pickles and other strong-smelling commodities which may taint them.

Meat and Meat Products

Meat should always be kept in cold store; otherwise, any harmful germs there may be in it will increase. Sawdust on the floor of a meat store is unhygienic and out of date; it becomes mixed with dirt and blown or kicked on to the meat. Trays (washed daily) should be used to catch the blood.

Manufactured meat products can be a source of danger and should be stored with the utmost care. Raw meats, *e.g.*, sausages, joints, minced meat, should be kept in the refrigerator, the minced meat being spread out; cooked meats, *e.g.*, brawn, pressed meats, tongue, meat sandwiches and meat pies should be stored at temperatures below 50°F. Only the quantities required for immediate use should be moved to the food preparation room, and these should be served promptly.

Bacon is a comparatively poor breeding-ground for harmful germs, provided it is kept dry; it should therefore be hung in a cold, dry, unrefrigerated place, protected from dirt and insects by a fine-meshed net covering.

Ham should be treated in the same way as meat.

Fish. Fresh fish and thawed frozen fish deteriorate rapidly and should not be held for more than a day or two. They should always be stored in the refrigerator away from other foodstuffs which might be tainted by them—if not in a separate compartment, then in lidded trays used only for fish. Frozen fish can be stored for long periods, provided it is kept below freezing point. Smoked fish and cured fish should not be refrigerated, but should be spread out on trays in the food store so that air can get to it.

Vegetables require ventilation. They should be stored on racks—preferably wire or metal—so arranged that air can circulate freely under and around them. The racks should be high enough off the ground to be not readily accessible to vermin, and it is an advantage if they are against an outside wall. Potatoes and root vegetables should normally be stored in sacks as delivered; but if they have been bagged in wet weather, they may be subject to disease and they should be turned out, aired and examined. The defective ones

should be removed at once. Cabbages and similar vegetables should be used the day they are received. If this is impossible, they should be emptied out on to the racks, but new deliveries should not be emptied out on top of older ones since this may result in the vegetables at the bottom remaining undisturbed indefinitely. It is for this reason that racks are preferable to wooden bins or to partitioned sections of the vegetable storage room. Stored vegetables should be inspected frequently, and, if they are held for more than a day or two, thoroughly, as decay spreads rapidly.

Fresh Fruit should be stored apart from other foodstuffs. Citrus fruit and apples are particularly liable to taint other food. Fruit requires dry, cool and well-ventilated storage, with air circulating all round, above and below. Fruit should be inspected frequently, as mould spreads rapidly on it; any mouldy fruit should be removed to the rubbish bins or swill tubs at once. High stacking of vegetables and fruit should be avoided as this crushes the lower units and renders them liable to mould growth and rapid deterioration.

Canned goods should be stored in a cool, clean, dry place, preferably in their original cartons. The stock should be frequently inspected, and blown, rusty and split cans should be referred to the local public health department without whose sanction the contents should never in any circumstances be used for human food. Some vacuum packed foodstuffs (for example, coffee) often present a blown appearance although the contents are safe for consumption. The containers of all canned goods which include syrup, water or oil should be periodically turned upside down on the shelves. Once the can is opened, the contents should be treated similarly to fresh food of the same kind.

Flour and Other Cereals. These should preferably be stored in metal containers, protected from rats, mice, insects, damp and casual damage. Such bins should have rounded corners and should be small and light enough for frequent and thorough cleansing, including up-ending for drying. The lids should be tight fitting, preferably hinged and self-closing. The best material for such bins is vitreous enamelware, but this is expensive; the best substitute is galvanised iron, which requires very careful cleaning. There should be sufficient surplus containers for each type of food, so that they can be emptied in rotation, and thoroughly cleaned out and dried each time they are emptied. A scoop should be kept in each container, as these foodstuffs will readily deteriorate if dipped into with damp scoops, or, worse still, with damp hands. A plastic scoop is best, as metal may damage the enamel of the bin. If considerable stocks of flour are held, it may be necessary to stack the flour in the original sacks. When this is done, the sacks should be on dunnage, and, in order that rodent colonies can be discovered and destroyed, they should be examined once a week and the floor and walls swept.

Sugar and salt should be kept in bins, with a surplus bin and a scoop, as with flour.

Jams should be kept in the store room in their original jars. On receipt the jars should be wiped to remove any spillage, as this would attract flies; and, for the same reason, any spillage on the shelves should be wiped up at once.

Jellies, trifles, custards and similar sweets should be made up on the day they are to be served, and kept in a cool place until served. If it is necessary to make them the day before serving, they should be stored in the refrigerator.

Dried egg should be stored in its original container, and the contents of any damaged containers should be regarded with suspicion. Reconstitution should be confined to the quantity required for immediate use. If any has to be retained, even for an hour or so, it should be carefully covered and put in the

refrigerator ; it should not be retained in reconstituted form over night, even in the refrigerator, for stored reconstituted dried egg used in lightly cooked egg dishes has been responsible for many outbreaks of food poisoning.

Use of the Refrigerator

Except where otherwise specified, the word "refrigerator" in this section means a room or a cabinet which will keep foodstuffs at a temperature between 32°F. and 40°F. at all times of the day and in all seasons of the year. The term "Cold chamber" is used to denote a "walk-in" food store with mechanical refrigeration maintaining a temperature not exceeding 40°F. (This section does not deal at all with the particular problems of "deep freeze" refrigerators. They are intended for the long storage of meat, fish, poultry, etc., and also for ice-cream up to the moment of sale.)

Almost all catering establishments find a refrigerator essential ; but not all catering establishments use their refrigerators wisely. It pays to acquire an understanding of the capabilities of the refrigerator and to use it with system and forethought.

The object of the refrigerator is to keep foodstuffs at a low temperature and thus to arrest the multiplication of germs and to keep the food in good condition. Refrigeration will not keep food indefinitely, nor will it restore food which is in bad condition or kill germs which are already present. Moreover, in most refrigerators air does not circulate freely ; and in all refrigerators there is a tendency for the contents to become damp, or at least moist. Refrigeration does not prevent susceptible foodstuffs from becoming contaminated by adjacent strong-smelling foods.

Almost all perishable foods keep better at low temperatures, and some deteriorate rapidly even in moderate warmth ; but some require to be kept dry and well ventilated even more than they require to be kept cold. It is clear, therefore, that, whereas some foodstuffs ought always to be kept in the refrigerator, others ought never to be put there.

There is a third category : those foodstuffs, mainly canned and bottled goods, which are as contented with normal room temperature as with refrigeration. Such foods should be kept out of the refrigerator in order to save space for the foods which require it.

Meat, poultry, game, fish, shellfish, eggs, prepared meat dishes, gravy, soup, milk, butter, margarine and other fats, cream, custard (and pastry containing cream, custard and synthetic fillings), and cooked food not required for immediate consumption, should always be kept in the refrigerator, priority for space being given to meat, milk, cream, custards, gravies and soups.

Flour, cereals, sugar, salt, bread, cake and pastry ought not to be put in the refrigerator.

The function of the refrigerator is to keep food cool. It should not ordinarily be used to cool hot food, because, if hot food is placed in a refrigerator, the heat from the food causes the temperature to rise ; and, if the heat of the food is too great in relation to the size of the refrigerator, the temperature will remain high for a considerable time, the atmosphere will become saturated with water, and the refrigerator will be rendered temporarily ineffective. This is a matter of relative sizes. Small hot joints could, of course, be put into a large refrigerated room.

In order to ensure that the refrigerator is used efficiently and economically, a senior member of the staff should be placed in charge of it and made responsible for deciding what foodstuffs should be admitted and how and where they should be stored as well as for ensuring that the refrigerator is kept clean

and in full working order. The refrigerator overseer need not necessarily handle the food ; but the number of people with access to the refrigerator should be restricted as much as is convenient. It is potentially dangerous (from a food hygiene point of view) to allow everyone to walk in and out of a cold chamber or to open the door of a refrigerated cabinet, putting food in or taking it out ; where that is done, the store is usually packed in an un-systematic way, since irresponsible people will make rearrangements or will put items in inappropriate places. Moreover, the more people who have access to a refrigerator, the more frequently the door is opened and the greater the chance of its being left open by mistake.

The refrigerator overseer should put up outside the door a list of the items which are to be refused admittance and should see that these items are excluded. If the staff get into the habit of putting foodstuffs into the refrigerator unnecessarily—this is often done on the plea that it won't do them any harm—the refrigerator will become crowded, and, even if there remains room for the foods which should be kept cool, there may be insufficient ventilation to keep them in proper condition.

Before the overseer can allocate each kind of food to the most appropriate position in the refrigerator he must know where it is coldest and where the air circulates most effectively. The coldest parts are usually the upper parts and the parts nearest the coils, but it is desirable to consult the manufacturers both on relative coldness and on air circulation. It is particularly necessary to know where to fit shelves and hooks in refrigerated rooms. Most small refrigerators are designed and fitted to accommodate each item of food and drink in the most suitable place, and the shelves and fittings should be used for the purposes for which they are intended. Everything should be so placed that air can circulate freely all round. Broadly speaking, liquids should be placed close to the freezing coils, meat products further away, and eggs and other foodstuffs farthest. The other broad principles to follow in arranging food are : food which is to remain in store a long time should be kept in the coldest part ; meat and fish which will shortly be required for cooking should be kept in the less cold part ; foodstuffs with strong odours (for example, fresh fish) should be kept as far as possible from foodstuffs which readily absorb taint (for example, butter) ; fresh fish should be kept in lidded trays ; meat and poultry should be hung on hooks, and arranged to obtain the maximum benefit from air circulation ; foodstuffs in glass or metal containers should be kept in the lower part of the refrigerator, so that the condensation drippings will not affect other foods.

The refrigerator overseer should inspect the food in the refrigerator at least daily, in order to make sure that everything is in good condition. It is useless to refrigerate food which is not in perfect condition ; food which is " going off " will continue to deteriorate in the refrigerator and may taint other food there.

Another of the duties of the refrigerator overseer should be to make a regular examination to ensure that it is functioning properly. The interior should be so constructed that condensation and drippings from the contents cannot find their way into the insulation, and the overseer should verify that this is not happening. Water can readily destroy thermal insulating properties, and other drippings can produce very insanitary conditions. Attention should be paid to the door fastening. The temperature should be checked frequently—at least once an hour during working hours when it is recorded externally. If it is not recorded externally, checking should be confined to occasions when the door is opened for some other purpose. If a proper temperature of something under 40°F. is not being maintained, the cause for this should be investigated ; if the higher temperature appears to have arisen because the door has been

opened too frequently, because it has been left open, or because hot foodstuffs have been introduced, the rules for using the refrigerator should be tightened and more strictly enforced ; if there is no apparent cause, the manufacturers should be consulted.

A safeguard against leaving the door of a cold chamber open by mistake is to fix outside a warning red lamp which will light up automatically whenever the door is open ; an even more effective device (especially suitable when the door is out of sight of the kitchen) is an audible signal adjusted to sound when the door has remained opened for, say, three minutes.

Before it is put into use, a new refrigerator should be washed out with a weak solution of vinegar and soda in order to prevent refrigerator odour tainting the foodstuffs.

A refrigerator should be cleared out and cleaned at least once a fortnight. Some may require more frequent cleaning. The time for cleaning should be fixed when the refrigerator is expected to be comparatively empty, and careful planning may be necessary. The walls should be washed down with warm soapy water (or a weak solution of vinegar and warm water) and the rails and runners should be scrubbed and brushed out. The floors of cold chambers should be scrubbed and mopped, and the gulley and trap should be flushed with hot water. Disinfectants should not be used. The fish and meat trays and the walls of fish and meat compartments should be thoroughly cleaned. The top and sides of refrigerated cabinets should be washed as part of the general cleaning of the kitchen.

The cleaning of the inside of the refrigerator should coincide with the defrosting—the removal of the excess ice and snow which forms round the refrigerating coils—which must be carried out periodically in order that the plant may maintain the correct temperature. The frequency with which defrosting is necessary depends on the extent to which the refrigerator is used, on the foodstuffs it contains and on the degree of concentration of water vapour in the surrounding atmosphere. Generally speaking, once a week will be found sufficient for large refrigerators, but defrosting need not be carried out so long as the ice and snow over the parts does not much exceed a quarter of an inch. Most small refrigerators, those with a capacity of $3\frac{1}{2}$ to $5\frac{1}{2}$ cu. ft., need defrosting at least every fourteen days.

SECTION F. PREPARATION OF FOOD

(including re-heated and made-up dishes)

There is a greater risk of food poisoning and other diseases arising from meals prepared in catering establishments than from meals prepared in private homes, partly because the preparation of food in bulk provides the opportunity for infection to be widely spread and partly because the practice—much commoner in catering establishments than in private homes—of preparing food some hours before it is to be eaten allows sufficient time for harmless numbers of germs to multiply beyond the danger point. A careless catering worker may cause an outbreak of food poisoning affecting hundreds of people ; a careless housewife rarely has the opportunity of upsetting digestions outside the circle of her own family and friends. It thus behoves all catering workers to exercise continual vigilance when preparing food. They should realise that danger may lurk in food which is apparently all right, and, as well as being on their guard against obvious dirt, they must beware of practices which may season the food with poisonous germs. The aim should be to ensure that all food served in the establishment is clean, fresh and in all respects fit for human consumption.

Meat requires special care. It is liable to pick up dirt during transit from the slaughter house to the kitchen and should always be washed (and, if necessary, trimmed) before being cooked. Knives, forks, cleavers, etc., used for cutting up meat should not be used for other foods, and separate knives should be reserved for raw meat, cooked meat and tinned meat. Germs from the raw meat may be transferred to the knife used for cutting it. Those that remain on the meat will probably be destroyed when the meat is cooked, but, if the knife is used to cut up corned meat which is eaten without further cooking, germs from the knife may cause food poisoning in whoever eats the corned meat. Cooks who have handled raw meat should wash their hands before touching cooked meats. All cooked meat including corned meat should be sliced and served without being touched by hand.

As much butchery work as possible should be done on worktables with an impervious surface which can be cleaned easily. Such surfaces are quite satisfactory for boning, dicing and similar operations. For work which needs a wooden chopping block a hardwood board can be fixed above or alongside the butcher's table. This board should be of diagonal construction and should be light enough to be removed for cleaning, scraping and rinsing after each period of use.

In "boning-out," e.g., sirloins, considerable handling and cutting by the butcher is necessary, and when "boned-out" meat is made into a rolled joint there may be heavy contamination at the centre. It is essential, therefore, that such joints should be cut up small and well cooked so that the germs at the centre are killed.

Minced Meat. The majority of harmful germs which may be on the outside of meat are distributed throughout the entire mass of meat by mincing, and unless minced meat is cooked at a sufficiently high temperature and for long enough to kill all the germs, the cooking will provide the warmth which will encourage the germs to multiply throughout the whole of the mixture. This activity can make the mince poisonous, or can give rise to discolouration or foul odours. Therefore, it is essential that only enough meat to provide a day's supply should be minced in order that the cooked mince is not allowed to stand overnight. If it is absolutely essential to cook more than one day's supply, the mince should be thoroughly cooked, cooled *rapidly* in small quantities, refrigerated overnight and *thoroughly* re-heated just before serving. Minced meat should always be heated in several small containers rather than one large one and timed while cooking. If root vegetables are added to mince, they must be very carefully cleaned, as the soil organisms they carry are very heat-resisting.

For *fish* the best practice is to use a stone slab long enough to fit across the sink used for fish preparation but only two-thirds of the width of the sink. A hard-wood block can be placed on the slab for the cutting. The fish can then be prepared on this slab with the tap water running and the waste water flowing into the sink below (Plate V).

Fresh fruit and vegetables and dried fruit should be thoroughly washed before being cooked and served. Lettuce for salad should be washed and broken up under running water and the washed leaves well drained on a clean draining-board. There should be separate sinks reserved for vegetable preparation; such work should not be done in the sinks or receptacles used for washing pots and pans.

Pastries and other dishes containing *synthetic cream*—and synthetic cream itself—require the utmost care. Synthetic cream is an excellent breeding-ground for germs, particularly during the warm weather, and it should consequently be used as quickly as possible after it is made up. During any

temporary storage it should be kept covered and as cool as possible. Proper nozzles, sterilized before use, should be employed with icing bags; on no account should the operator blow or suck at the nozzle to maintain the flow of icing. (See pages 57 and 58.)

Food in Doubtful Condition. If there is any doubt about the condition of an article of food, it should be referred to the chef or the manager for authority either to use it or to remove it to the rubbish or swill bin. Any large quantity considered unfit for use should be reported to the local health department and put on one side away from other foods pending examination by the Sanitary Inspector or other qualified officer. Utensils and equipment which have been in contact with food which is so discarded should be specially and thoroughly washed. The staff who have touched this food should wash their hands before doing other work.

Re-heated and Made-up Dishes

The practice of preparing and cooking meat, gravies, sauces, made-up dishes, trifles, custards and so on the day before use is one which should be restricted to the utmost. If such foods are to be re-heated before service, they should be thoroughly heated in order to destroy any germs present. Warming-up may cause the germs to start multiplying and may thus transform a safe dish into and unsafe one. Semi-liquid dishes, such as soups and stews, should be brought to the boil and allowed to simmer for at least fifteen minutes; solid dishes—joints, rissoles, meat-pies, fish-cakes, etc.—should be fully heated. In any case, these pre-prepared dishes, whether liquid or solid, should not be re-heated more than once, that is to say, they should not be heated more than twice in all. It must be remembered that some germs leave traces of poison in the food, and these poisons cannot be removed by heating.

Cooked food which is not used on the day for which it is prepared ought not to be held over for the next day (and certainly not for the third day, or over a week-end). If it is necessary to hold over such food, it should be stored in the refrigerator—after any requisite cooling. It should then be heated thoroughly before it is served. The cook should remember that heat takes a long time to penetrate to the centre of a pie or made-up dish.

It is essential that meat and meat products which have been heated and not consumed at once should be stored in the refrigerator, but they must first be cooled to normal room temperature. Such cooling must be carried out as rapidly as possible, because any harmful germs will be continuing to multiply as long as the meat is warm. Pre-cooked foods ought to be *rapidly* cooled. It is worse than useless to attempt to cool the made-up food in the temperature of the kitchen, since most kitchens are uncomfortably warm. The cooling (even if done by fan) should be carried out in a separate room set apart for the purpose. Such a room can, of course, be used for other purposes at other times.

Thorough cooking and thorough cooling take place more rapidly in small portions than in large ones. Therefore, when a cooked joint or made-up dish is to be refrigerated, so that it can be served cold or heated for the next day, it is best to cook it in portions; to cook a large joint and then to cut it up for cooling is less effective. If it is impracticable (as it may well be for reasons of space) to cool the food in small portions, then, before it is refrigerated, it should be tested to ensure that it is really cool; it may be that the centre is still hot although the surface is cool. Judgment, based on experience, must be exercised to determine when it is safe to put the food in the refrigerator. Soups and gravies can be cooled quickly and effectively by transferring them from the large, deep cooking vessels to small shallow ones.

It is worth while to linger over this problem of the swift cooling and subsequent refrigeration of pre-cooked foods, because it is one of the most important—some experts think the most important—food hygiene problems which confront the caterer. Many caterers find it necessary to prepare made-up dishes the day before they are to be consumed ; from the point of view of food hygiene, this is most undesirable, but, for reasons unconnected with food hygiene, it often cannot be avoided. Unfortunately, the dishes which are frequently prepared in advance are precisely those—joints of meat, made-up meat dishes, gravies, custards, trifles, etc.—which are easily contaminated and which provide good material for the multiplication of germs. Many outbreaks of food poisoning which have been investigated have been traced to made-up dishes of this kind which have been allowed to remain warm for long enough for germs to multiply.

(It is a sombre thought that some outbreaks of food poisoning have resulted from meals consumed at weddings. Caterers for weddings and other functions should avoid, as far as possible, the practice of laying out food in advance, which may result in the exposure of the food for some time in a warm atmosphere.)

SECTION G. DISPLAYING AND SERVING FOOD

If food served to the public in a catering establishment is to prove a cause of food poisoning or other disease, it is probable that it has been contaminated before it reaches the display counter or dining room. Since sufficient time at a suitable temperature is required for the dangerous multiplication of food-poisoning germs, it cannot often happen that food becomes disastrously infected after it reaches the dining room. But there are unpleasant possibilities, and these are pointed out below.

Dining-rooms

No wise caterer neglects the appearance and condition of his public rooms. Even if, in deference to a need to maintain an impression of simple accoutrements and the greatest possible value of meals, the rooms are plainly furnished, the caterer will be minded to preserve them in a state of cleanliness. It is important that he should not be deterred by any bad habits of customers, and that, as a matter of rigid routine, he should be at pains to clear waste and mess from the tables and floors as the service of meals proceeds.

There are several reasons why it is important that the public rooms should always be maintained in a state of thorough cleanliness throughout the time of service : firstly, the risk of contamination is always present ; secondly, a clean dining-room sets an example of cleanliness to the customers ; thirdly, many customers—justifiably—tend to regard dirtiness in the dining-room as evidence of dirtiness in the kitchen. Alike for the protection and for the satisfaction of his customers a caterer cannot afford uncleanliness anywhere in his establishment.

Tables should be so constructed that they can be cleaned easily. Some designs which develop cracks and crevices (for example, between glass top and wooden or wicker edges), are dust-traps. The type with a ledge underneath for books, parcels, handbags, etc. helps to keep the table-top clear and is to be recommended. In cafeterias a tray-rack at the end of each table helps to keep the trays from being stood about to get kicked and trodden on.

If table-cloths are used, they should be clean at least once a day and changed more frequently if necessary. A table napkin should not be used a second time until it has been washed. Paper serviettes once used should be destroyed. Cruets, menu-holders, ashtrays and other permanent table furniture should be cleaned daily.

Waiters and Waitresses

Waiters and waitresses should be trained so that they always pick up spoons, knives, forks and cups by the handles, dishes by the rims, and tumblers by the bases. They should be careful to avoid handling crockery and cutlery by the parts which will come into contact with food or touching with their fingers either solid or liquid food being served to customers. They should never wipe or polish crockery or cutlery with the cloth which they use to wipe the table. The waiter's teacloth should be replaced often enough to ensure that the cloth in use is reasonably clean. When laying the table and when bringing food to the table, waiters should examine the cutlery and crockery to make sure that it is clean, and they should send to the washing-up room any item which is not clean. Food should not be served in utensils which are chipped, cracked or otherwise so damaged as to render cleaning difficult. The practices of rubbing off visible dirt, egg stains, lipstick, etc. with a cloth—or with the finger—or of blowing on to surfaces before polishing them—should not be tolerated. Even more reprehensible is the practice—which may occasionally be observed in some restaurants—of wiping dirt off food and then serving it.

Clearing Tables

Used dishes and left-over food should be cleared from the tables promptly. Customers should not have to sit down at a table cluttered with the remains of the previous customers' meals. This not only annoys the majority of customers, it encourages the minority—the ones whose habits are dirty—to think that they have come into a dirty place and have no need to conduct themselves decently. Moreover, dirty dishes lying about on the table attract flies.

Clearance of used utensils should be by hand or by tray. Trolleys are slow ; they obstruct the gangways ; and the sight of the garbage pans on the trolleys is frequently offensive to the customers.

Tumblers should be removed from a table as soon as it is vacated, so that the next customer does not make the mistake of thinking that they are clean. Clean tumblers for water should be placed upside down on the table.

The Service of Milk and Ice-Cream

Particular care is required in serving these, since germs multiply freely in them. *Milk*, once drawn from the bulk supply, should not be put back. If a dipper is used to draw milk from a bulk container, it should be clean and should have a long handle so that there is no danger of milk overflowing from the dipper and washing germs from the server's hands into the bulk supply. If the milk is received in bottles, it should be kept in the bottles until it is required for use. When milk is served in a jug, the jug should be scrupulously clean. Spoons, scoops, dippers or spatulas used for serving *ice-cream* or other frozen desserts should be carefully stored and handled at all times. If a dipper-well containing a bactericidal chemical is used, the water should be frequently changed—at least every half hour or whenever a new container is broached, whichever is the shorter period.

Consumption off the Premises

When food is sold for consumption off the premises, it should be wrapped in clean paper or in a clean bag. Unnecessary handling of the food should be avoided, and the seller should never lick a finger to separate sheets of wrapping paper or blow into a paper bag to open it.

Food on Display

Food awaiting service to the customer is normally on display in cafeterias and the quick lunch counters of public houses, and some items of food—

chiefly salads, cold collations, rolls, cakes, pastries and sweet courses—are often set out on service counters in restaurants, including indeed some expensive restaurants. Whatever the kind of food or the type of establishment, the problem with food on display is basically the same: how to protect it from casual contamination by customers or staff and at the same time keep it readily accessible for quick serving. With coffee-stalls, exhibition ground buffets and snack bars largely open to the street there is an additional danger of contamination from wind-borne dirt.

Cafeterias and Snack Bars

A number of special problems arise in cafeterias and snack bars, where food is normally displayed to customers for their selection and where customers sometimes sit or stand at the counter and eat in close proximity to food awaiting service. Particular care should be taken to protect the food from contamination by customers. The caterer has little control over his customers. He cannot know whether they are carrying infection; he cannot require them to wash their hands before eating; he cannot prevent them from sucking their fingers, patting their dogs, smoking, coughing or sneezing while at his counter; and he may even be afflicted with customers who spit on the floor. For the sake of the customers whose manners are more delicate the caterer should keep the food protected.

Unless the management organises an efficient service for clearing the tables immediately after they are vacated, the tables in cafeterias and snack bars become dirty, untidy and crowded with used utensils and over-flowing ash trays. A high standard of orderliness and cleanliness should be conspicuous on both sides of the counter.

The greatest danger lies in the cafeteria so arranged that the customers file past a counter where hot or warm food is on display; if a customer coughs or sneezes over such food, germs may be sprayed over it, and, if it is not served and eaten promptly, they may multiply to a dangerous concentration. The danger is probably greater where the food is set out on a hot plate in trays or bowls and served by an attendant, since some part of it may remain uneaten for a considerable time; but even where the food is already set out on plates, one particular plateful may remain long enough for the person who eventually consumes it to be made ill. There is no doubt that all warm, moist food on display should be protected from the customers. The practice of some customers of pinching or fingering rolls or cakes before making their selection is unpleasant, but it is less dangerous to health because germs do not multiply readily on a hard dry surface; in deciding whether or not to screen the rolls and cakes, the cafeteria manager has to decide whether to please those customers who like to make their own selection by way of trial and error or those customers who prefer their food unfingered. Whether the customers help themselves to rolls and cakes or are served by an assistant, it is worth while to discourage fingering by providing plastic tongs or sharp-pronged forks.

Many of the items sold at snack bars—for example, sandwiches, rolls with fillings, cake, fruit, sweetmeats—are nowadays displayed in cellophane wrapping. Where this is done screening is unnecessary. But pre-wrapped food is not necessarily safe food; contaminated food is not rendered safe by artistic packaging. Food that is to be pre-wrapped should be fresh, and it should be packed hygienically in clean surroundings and touched by hand as little as possible. The wrapping should be perfectly clean. Paper cups and cartons and similar single-service utensils may be found particularly useful for the service of ice-cream, drinks and snacks at sports grounds, exhibitions and other places where it would be difficult to wash-up crockery properly. They should, however, be stored carefully so that they are clean, and they should not be

used a second time. Receptacles should be provided for their disposal after use ; hygiene is not promoted by the creation of litter.

Whether food on display is covered or not, the counters and fittings should be readily cleanable. Stainless steel, chromium, glass, marble and some plastics are all easy to clean and can be made to look attractive. The manager should make it his business to see that counters and display cabinets are kept clean and pleasant throughout the time of service.

There should be an ample supply of clean swabs so that the assistants can wipe up spillage or smears promptly. The amount of food on display should be restricted so that no items are left exposed to the room atmosphere for an unreasonably long time. Perishable foods should be replaced daily. If fruit is on display, the assistants should be forbidden to breathe on it before polishing it or to use any material or substance except a clean cloth for polishing.

Covers for Food

An occasional risk in the cafeteria system arises from the general practice of collecting the second or sweet course at the same time as the first course. The sweet course, originally perhaps warm, may remain on the diner's table, exposed to infection from coughs and sneezes, for long enough—particularly if the diner starts with soup or plays chess during his lunch-hour—to develop undesirable qualities. Some cafeterias provide metal covers for these dishes ; these are excellent, both for keeping the food warm and for keeping it clean—provided the covers themselves are clean and kept clean. It is essential that these covers should be taken out of service and re-tinned as soon as they begin to rust.

Kitchens on View

Some cafeterias are so arranged that the customers can see into the kitchen. A lay-out of this kind helps to instil confidence in the minds of the customers—provided always that the kitchen is a clean one and the staff are careful to adhere to hygienic practices. It would materially assist to raise the standard of cleanliness in cafeterias if more owners had the courage and the confidence to adopt this policy. Where the kitchen is in view it must be clean. The growing practice among caterers of inviting customers to visit the kitchen is most encouraging to all who have the cause of hygienic catering at heart.

SECTION H. STORAGE AND DISPOSAL OF SWILL, WASTE AND RUBBISH

Many caterers have arrangements with pig-keepers, poultry-keepers or manufacturers of animal feeding stuffs for the disposal of their kitchen waste and the leavings from plates. The manner of separation of this material from ordinary rubbish, and the precise arrangement for its storage and collection, necessarily depend to some extent on the requirements of the purchaser. Certain general principles apply.

It is important that all swill and rubbish should be removed from the premises promptly and should be stored, pending removal, well away from food, food utensils and the places where food is prepared or served. Swill should be collected daily. In most areas, it is possible to make special arrangements for the frequent removal of trade refuse.

The ideal storage arrangement is for the swill and rubbish to be placed, pending disposal, in bins in a yard close to the back entrance to the premises. The bins should be of metal—galvanised when this is obtainable—stoutly constructed, painted or bitumenised to prevent rust, and with tightly fitting lids, preferably with a clip to prevent their blowing off.

Swill bins and rubbish bins attract rats, mice, cats, dogs, birds, flies, blue-bottles and other unwanted intruders, and it is therefore important that the lids should always be kept on and that the area around should be kept clean. The yard should have a cold water tap, fitted with a length of hose sufficient to enable the bins, and the yard itself, to be sluiced out.

The rubbish and swill bins should be housed on a concrete platform, about 18" above the ground (or on iron racks) in a concrete, drained yard. The top of the concrete platform should be slatted to avoid the accumulation of moisture round the base of the bin, and it should be wide enough to enable the bins to be stood about 9" from the wall. It should be roofed so that the bins are shielded from rain and sun (Plate I). It is desirable to maintain entirely separate bins for swill and for rubbish—plainly marked—and to have sufficient additional bins to ensure that there will be no overflow if there is any delay in collecting. Bins should be used in rotation. After use they should be rinsed out with warm water and scrubbed with soap, disinfectant and a long-handled brush. If the swill contractor supplies his own swill-bins, he should provide clean bins in exchange for any full ones he takes away.

Grease recovered from the grease-traps of drains from kitchens and washing-up rooms should be kept apart from food and disposed of as inedible fat. Pending disposal it should be stored in a metal receptacle with a tightly closed lid.

Consideration should also be given to the piling of kitchen waste and plate-scrapings in transit to the swill bins. Some reasonable compromise must be found between the hygienic necessity of getting this stuff right away from the food at once and the practical fact that it is undesirable for frequent visits to be made to the swill tub by staff engaged in handling food or food utensils. The normal practice of accumulating swill in sink-tidies and swill-bowls is not unsatisfactory, provided these receptacles are not allowed to stand about when full and are washed out in hot water as soon as they are emptied. An alternative is to accumulate the waste in a papier mache carton which can be placed direct into the rubbish bin. This may not suit the arrangements of the swill contractor, although it is plainly a tidy way of disposing of refuse.

An accumulation of the containers in which food is delivered—boxes, cartons, bottles, jars and tins—is undesirable. These should be returned promptly to the manufacturer or disposed of as salvage without delay. If they are kept for re-use in the establishment—not a good practice—care must be exercised. Bottles, jars and tins should be washed out and dried and then stored with their lids or stoppers on, and they should be washed out again before use. Boxes and cartons, if clean, can be used for storing canned goods. Wrapping paper could be used a second time as an outer wrapping, but ought not to be brought into contact with food if it has been used once.

SECTION I. WASHING-UP

The term "washing-up" is used here to denote the cleansing of all crockery, glassware, cutlery and other utensils used by customers, or by cooks and catering workers for preparing and serving food, including the metal and other mixing and cooking vessels which are usually taken care of in the pan-wash (or pot-wash).

Few caterers—and very few catering workers—appear to realise the importance of washing-up. The thorough cleansing and effective sterilization of the utensils used in the preparation, serving and consumption of food are among the most important of the caterer's obligations to his customers; yet

washing-up is usually regarded as a menial task, suitable only for the least-paid and least-efficient employees ; and dirty utensils are often allowed to accumulate (as far as stocks allow) until the end of the day, with the result that washing-up is the final job and getting away early the reward for skimping it. It is common enough for customers of catering establishments and canteens to be served with dirty crockery or cutlery, particularly with cups stained with lipstick or the over-runnings from previous fillings ; and it is not uncommon for customers who object to such utensils to be treated by the serving staff as unreasonably fussy.

Yet there is a real danger that utensils which come into contact either with the mouth or with food may help to spread many diseases besides those commonly included in the term "food poisoning." This danger is none the less serious because it is not known how many people are made ill in this way.

Although it is not possible to estimate the extent to which illness is contracted through badly-washed utensils, it is practicable to assess the efficiency of the washing-up process. Bacteriologists estimate this by taking swabs from utensils before and after washing-up and by making a bacterial count from these swabs and from the washing-up water, the mops and drying-cloths.

The results of such tests show the importance of ensuring, not only that the utensils used for preparing and serving food are visibly clean, but also that they are sterilized to free them from invisible and harmful germs. ("Sterilized" means "commercially sterilized." Throughout this booklet, the word "sterilization" is not used in the strict bacteriological sense of complete freedom from all living bacteria and spores, but as meaning freedom from harmful bacteria in an active form.)

In order that washing-up shall be efficiently done, the staff engaged on it should be fully aware of their responsibilities, taking a pride in their work and with no incentive to scamp it. They should keep their hands meticulously clean while at work. People with open wounds or sores on their hands or arms should not wash-up—not only because the germs from such places may contaminate the utensils, but also because some detergents irritate sores and cuts.

Washing-up can be done by hand or by machine. In practice, nearly all machine-washing usually involves some hand work, and few catering establishments use machines for all their washing-up. Some wash crockery by machine and cutlery by hand. The pan-wash is always done by hand, and many machines are not adapted to take tea-pots, milk-jugs, and cooking or mixing bowls and basins. The small business cannot afford to invest in a machine specially adapted for these purposes since there will be comparatively little use for it. It may be claimed, indeed, that the thorough cleansing and sterilization of bowls, tureens, meat dishes and all other receptacles in which food is to remain moist and warm long enough for germs to multiply dangerously is so important that these utensils should invariably be washed by hand.

Washing-up by hand, *if properly done*, is as efficient as washing-up by machine. The washer-up can give attention to each article and ensure that lipstick stains, mustard, congealed fat, and so on, are removed ; the machine cannot treat each piece individually. In practice, however, the machine often produces the better results ; for washing-up by hand is frequently scamped.

Whichever method is used, the washing-up should be done promptly. The accumulation of dirty utensils should be avoided, not only because they become more difficult to clean the longer they are left, but also because there is a risk of dangerous germs multiplying in the food residues. Moreover, dish-washers are likely to be intimidated into slap-dash carelessness by the sight of large piles of "dirties" awaiting their attention.

The careful caterer will devote much of his attention to the work of the washers-up. The whole operation of washing-up should be in the charge of a responsible person ; and the washing-up rooms should be laid out in a convenient manner so that the washed utensils are placed ready for further service with as little handling as possible.

Efficient washing-up requires suitable equipment ; and its value will be destroyed if the articles, when washed-up, are not stored in a clean place. It is also essential that there shall be adequate reserves of crockery, cutlery, glassware and cooking utensils, so that there can be no temptation to hurry the washing-up process at rush hours—or, worse still, to neglect it altogether. The rush hour practices of rinsing cutlery in a jug of tepid water, and of "washing" a plate by holding it under the cold water jet and then wiping it with a tea-towel before placing it before a customer, should not be tolerated in any establishment—however impatient the customer may be.

Crockery and Cutlery ; Preliminary Scraping

As soon as possible after use, the dirty articles should be taken to the washing-up room, sorted into their various categories and sizes, and stacked. During this process food residues should be scraped or tipped off into the refuse containers. The object of this scraping is to keep the washing-up water as free as possible from food particles and their attendant germs ; therefore, the more thoroughly it is done the better. It is worth while to remove at least the looser parts of egg-stains and fat-stains now ; there is thus an additional advantage in doing this job promptly after use before such matter congeals on the plates. This scraping should be done by a wooden spoon or a blunt knife or other implement which will not scratch the crockery ; or it can be done by running water, provided the solids are caught in a strainer and not washed down to clog the drain-pipes.

Liquid residues in cups, tumblers and soup-plates should be emptied away at this stage.

Hand-Washing of Crockery and Cutlery

Some authorities consider that three sinks are necessary for perfect washing-up ; but it is generally agreed that excellent results can be obtained with two sinks provided the water is hot enough and is changed sufficiently frequently. The cost in equipment, materials and labour of the three-sink method is probably beyond the reach of most businesses of the size for which this booklet is primarily designed and the two-sink method is therefore recommended here.

In the two-sink method the first sink is used for cleansing and the second for sterilizing ; the first should have both hot and cold water laid on and the second hot water. Both sinks should have devices fitted to record the temperature of the water. A compartmented sink is as satisfactory as separate sinks, provided the partition is high enough to prevent water slopping from one compartment to the other and provided the water temperatures are recorded separately.

After the preliminary sorting and scraping described above the utensils are washed in the first sink, piece by piece, in clean hot water at a temperature of about 140°F. and a detergent. (Detergents are considered later in this section, page 53.) This temperature is too hot for the hands, and the washer-up wears rubber gloves and uses a mop. The water is changed as often as it becomes dirty or greasy. It is not sufficient to let out a little of the water and fill up with hot, for the grease and dirt remain ; the whole sink is emptied, rinsed out and refilled with clean, hot water, and fresh supplies of detergent added.

After this cleansing the utensils are suitably arranged in wire baskets for immersion in the sterilizing rinse. The utensils are so placed that no two pieces touch each other and so that all the surfaces of every piece (except the parts actually touching the wire) will be exposed to the rinse water. The rinse will be ineffective if plates or saucers are piled one on top of another or if cutlery is merely heaped in the basket. The baskets themselves have handles high enough to reach clear of the water. The sterilizing rinse in the second sink is of clean hot water, without added detergent or chemical, at a temperature of about or not less than 170°F. ; and the utensils remain in it for a full two minutes—carefully measured by a time-piece and not just guessed at. The purpose is to raise the temperature of the utensils to that of the water so that they will air-dry almost instantaneously ; this object will not be achieved unless they remain in the water for at least two minutes. The temperature of the water is maintained at about 170°F. throughout this operation. As the utensils are already clean, it is not necessary to empty the sink completely when more hot water is added (Plate IV). When the two minutes are up, the baskets are removed from the sink and stood temporarily on a draining board. As soon as the crockery is dry and cool enough to be handled it is stacked and put in a clean place awaiting re-use.

If water substantially hotter than 170°F. is used, the time for sterilization of *crockery* can be shortened ; for example, if the water is actually boiling, half a minute is long enough. It is not, however, sufficient merely to pour scalding water over the washed utensils, as the water does not remain on the utensils long enough to kill the germs.

A cheap and satisfactory alternative to sterilization in hot water in a second sink is steaming in a closed cauldron or saucepan over a gas-jet or on an electric hot plate. This method is suitable for an establishment where the number of utensils to be sterilized is not large.

To hold water at a desired temperature sinks or tanks can be obtained with a thermostatically-controlled heating unit or with a perforated steam pipe operated by a hand valve which admits live steam at the bottom of the sink (Figure XIV). A simple method is to provide a controllable gas-ring under a steel sterilizing sink.

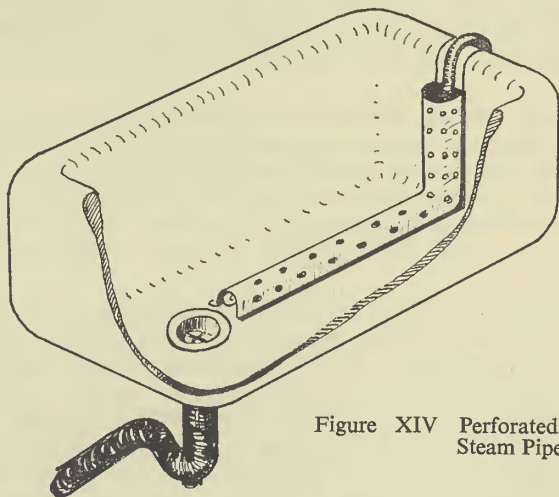


Figure XIV Perforated Guard for Steam Pipe

Drying by cloth cannot be recommended and is, in fact, quite unnecessary for crockery—although it is probably desirable for cutlery. A wet, steamy atmosphere, such as is unavoidable in a washing-up room, is favourable to the multiplication of germs, and drying-cloths pick up germs readily from the hands of the dryers-up, with the result that cloth-drying frequently puts back on the crockery as many germs as have been removed in the washing. Bacterial counts, both in laboratory experiments and under working conditions in catering establishments, demonstrate that drying-cloths are undesirable; if they *are* used, they should be in ample supply, a clean cloth should be taken as soon as the one in use gets wet or at all dirty, and the used cloths, as well as the dish-cloths and mops, should be boiled before re-use. Whether cloths are used or not it is important that crockery should be dry before it is put away. Germs do not multiply on a dry surface.

Machine-Washing of Crockery and Cutlery

There are many good makes of mechanical washers on the market, and there is no doubt that such machines save time and labour. Properly operated, they produce good results. But it must be remembered that a machine is not human and cannot correct the errors of the operator. A washing-up machine is no more efficient than the operator allows it to be.

It is important, therefore, that if machines are used, they should be maintained in proper working order and operated efficiently in accordance with the manufacturers' instructions. The operators should be conscientious people who understand, not only the working of the machine, but the reason for each process.

In purchasing a washing-up machine it is important to bear in mind that all sprays, jets, brushes and movable parts should be readily accessible for inspection and cleaning. There are several types—turbulent immersion in a sink, spray (semi- or fully-automatic) and sink with brushes—all of which can produce good results if properly maintained and operated.

In some machines the rinse water is used again for washing; this is usually a defect, since the rinse water inevitably contains some food particles, and neither the correct temperature nor the correct strength of detergent is maintained.

The essential functional requirements of a washing-up machine are that it shall, firstly, cleanse the utensils so that all food particles are removed and the utensils left visibly clean, and, secondly, sterilize the cleaned utensils so that no dangerous germs remain alive on them. For this it is necessary that the racks, sprays, jets, brushes (or whatever are used) should be so arranged that every surface and every edge of every utensil is exposed, for the whole of the necessary time, to the full force of each process. The principle employed—jets of water, water agitation, revolving brushes, etc.—is not so important from the caterer's point of view as the temperature of the water. If the water in the cleansing chamber is not hot enough, the fat in the food residues will not be melted and will remain on the plates. (The temperature of the washing water is thus more important in machine-washing than in washing by hand, since the hand dish-washer should notice any particles adhering to a utensil and mop them off.) If the water in the sterilizing chamber is not hot enough, the utensils will not dry quickly and completely.

A detergent dispenser is a useful fitting in a washing-up machine because it implies that the detergent solution will be added to the cleansing water in the correct concentration; but a drying apparatus (except in a glass-washing machine) should be regarded with suspicion, since drying should not be necessary if the water in the sterilizing chamber is hot enough to sterilize. What is



important is that thermometers should be fitted to every machine, recording the temperatures of the wash water and the rinse water—and fitted in places where they can be easily read. Thermostatic control of wash and rinse water and any device which tends to defeat either the careless or the deliberate lowering of temperatures or shortening of times is valuable.

The operation of washing-up by machine should be carefully planned and carried out methodically. With most types of machine preliminary scraping is desirable. The smaller the amount of food and dirt that gets into the cleansing chamber the better. If racks or baskets are used, the utensils should be so arranged in them that every piece is fully exposed to both processes. Plates or saucers should never be piled one on top of another. In machines with an upward jet cups and bowls should be placed upside down and secured against over-turning. Knives, forks or spoons should not be allowed to overlap each other. The utensils should be left in the machine for the full length of time stipulated by the manufacturer, and any attempt to "beat the machine" by taking the utensils out in advance of programme should be regarded as dangerous to the health of the customers. The hands that stack the utensils when they emerge from the machine should be clean. The utensils must be allowed to dry completely before they are stacked.

It must not be regarded as certain that every article which has passed through a washing-up machine is necessarily clean. Before the utensils are put away to await use they should be examined individually to ensure that they are dry and clean. Any that get through visibly dirty should be put through the machine again. If more than an occasional item comes out unwashed, the machine is either out of order or is being operated incorrectly, and some investigation is necessary. If the crockery does not dry quickly, it is probable that the rinse water is not hot enough; this may be due to a defect in the machine, but is more likely to be due to tampering by the person in charge of it.

When a kitchen-hand pulls a crockery tray clear of the machine without allowing the full time for the sterilizing rinse, the crockery will probably be stacked before it has dried properly, and if it is stored in a warm atmosphere, the moisture, in evaporating, will leave a brown stain. Such a stain may result from the use of an unsuitable detergent, but more frequently results from the employment of an unsuitable kitchen-hand.

Plastic Ware. If plastic ware is used, care should be taken to ensure that it will stand up to the temperatures required for efficient sterilization.

Glassware. It is best to wash glassware by the method described above for crockery, but some glassware may not stand the high temperatures required for sterilization by hot water and chemical sterilization may be necessary. If glass-washing appliances are used, full regard should be had to the instructions of the manufacturers. In some machines the temperature of the water is not high enough to enable the tumblers to dry promptly and, if cloths are used to dry and polish the tumblers, the cloths should be clean and dry.

Special Crockery Utensils. Certain articles, for example teapots, require special cleansing. Such articles should be given individual attention in order that all surfaces are cleansed and sterilized. Special brushes should be kept for cleaning the spouts of tea pots, coffee pots and other similar utensils.

Silverware should be cleaned from time to time with a good silver polish and a soft cloth. After such cleaning it should be put through the complete washing-up process as if it had been used.

Knife-cleaners. Knives should be thoroughly washed and dried before they are put into a knife-cleaner and they should be carefully wiped afterwards with a clean dry cloth in order to remove any polish which may remain on them.

Detergents

In the first (cleansing) sink a detergent should be added to the water, since water alone is insufficient to cleanse utensils. The most commonly-known detergent is soap, but soap by itself, in bar or flake form, is now seldom used for washing-up. There are many alkali soap-powders, soapless detergents, soap substitutes and detergent materials of varying utility—all used in a solution of water.

Detergents should be bought with discrimination, and it is worth while to give some consideration to the type of detergent most suited to the conditions. The principal circumstances governing the choice of a satisfactory detergent are the hardness of the water, the method of washing-up, the equipment to be used, the type of meals served and the temperature of the water in the cleansing sink. In addition to this the detergent must be added to the water in the appropriate concentration. The use of detergents in concentrations greater than those recommended may lead to irritation of the skin.

In view of the variety of factors and circumstances this booklet cannot give detailed advice, and caterers would do well to consult the local health department as well as makers of washing-up machines.

Briefly, the ideal detergent solution should be free from harmful ingredients and should possess qualities which enable it to wet thoroughly the utensils to be cleansed, to emulsify the fats, dissolve the food materials, break up the particles of dirt and solid matter, to prevent the formation of film and scale, and to be itself readily rinsed off the utensils.

It is probable that no one detergent possesses all these properties in sufficient measure. Soap itself is not entirely satisfactory for washing-up, and in hard water it tends to leave an insoluble deposit on utensils. The soap-alkali mixtures are less affected by hard water, and the soapless detergents not at all. Satisfactory results are not likely to be obtained by mixing detergents. Whatever detergent is used, it is important that it should be used in correct concentration throughout the washing-up process. It is very difficult to maintain a correct concentration if the washer-up is in the habit of pouring in more hot water as the water in the cleansing sink cools. It is best to empty away the whole of the cooling water and to refill the sink with hot water, adding the detergent in measured amount. When cleansing under running water (as in some makes of machine) a detergent dispenser, regulating the amount of detergent solution added, is absolutely necessary.

A detergent is an essential ingredient in the *cleansing* process of washing-up. It must not be regarded as a substitute for the *sterilization* process. Only in exceptional circumstances, where the use of more than one sink is impracticable, for instance when dealing with materials which will not stand the heat required for water sterilization, should the use of a combined bactericidal and detergent preparation replace a separate sterilization process.

In hard water districts a water-softener is advisable, particularly if washing-up is done by machine. Unless water is softened before it reaches the washing-up machine, the sprays and jets will accumulate heavy chalky deposits which slow up their operation, and the machine has to be stopped frequently for cleaning. If a softener is used, it should be serviced regularly and recharged or regenerated whenever this is required—a matter which will depend on the amount of water used. In this regard the manufacturers' instructions should be carefully followed.

The Pan-Wash

The pots, pans and other cooking vessels should be washed separately from the crockery and cutlery at sinks reserved for this purpose. The pan-wash is usually a greasy job and requires ample supplies of clean, really hot

water, capacious sinks, suitably adapted grease traps and drainage. It is worth while to collect the grease at the earliest possible stage, since this saves cleaning at a later stage.

Pan-washing should be done by hand. It will probably be desirable to employ a special detergent, since particular scouring properties will be required. In choosing both the type of detergent and the type of pot-scour (if a scour is used) attention should be paid to the dangers of removing or damaging the surfaces of enamelled, copper or other non-homogeneous cooking vessels. (Such vessels should be discarded when the surface begins to go.) It is, of course, desirable to remove most of the food debris before washing the pans ; for this purpose a swab or a rubber scraper is preferable to a metal scraper.

The prompt and efficient cleansing and sterilization of cooking utensils (and of utensils which hold cooked food in bulk, such as vegetable tureens and meat dishes) is equally as important as—if not more important than—that of the utensils used by customers. Hot food is kept in the cooking and serving vessels for a considerably longer time than it normally remains on customer's plates, thus allowing any germs which may be present a considerably longer time to multiply. It is, therefore, essential that all cooking vessels should be cleansed promptly after use, that all particles of food should be removed from them and that they should be sterilized sufficiently to kill any lingering germs before they are used again.

There is a further reason why metal cooking vessels should be washed-up promptly. If they are left unwashed for any length of time, the grease in the food particles will go rancid and impart a rancid odour to the utensil and the moisture will cause rust.

After they have been washed and rinsed pots and pans should be stood on their sides, or upside down on slatted shelves, to dry. Colanders, strainers and sieves should be hung up in an airy place to dry and should not be stored in drawers or cupboards.

Containers Used for Carrying Meals. When meals are conveyed in bulk from the kitchen to a distant service point (for example, to a group of workers) the containers (and their lids) used for such service should be thoroughly sterilized after each use by a steam jet under pressure. The containers should be circular, with a concave base and with as few internal angles, joints and seams as possible. The lids should be tightly-fitting.

SECTION J. CLEANING OF PREMISES AND EQUIPMENT

Cleanliness is the key to health ; and the customers of a catering establishment have the right to expect that a state of thorough cleanliness prevails in the places where their food is prepared. In the earlier chapters of this booklet stress has been laid on the importance of the premises, fittings and equipment being so designed and constructed that cleaning can be readily carried out. The corollary is that they shall be kept clean.

The cleaning of premises and equipment should be carefully planned so that every part of the premises and every item of equipment is attended to regularly, and the routine should be set out in a written programme so that the cleaners will know precisely what is expected of them. Ample time should be allowed for this important side of the work, and the staff concerned should have no excuse for neglecting or scamping it. Each part of the job should be timed to fit in with the general organisation of food preparing and serving in the establishment ; nothing should be left to the whim of the cleaner, and there should be no question of a cleaner omitting an item or "getting forward" with the

time-table in order to leave early. The manager should himself keep a copy of the programme before him and should satisfy himself that the cleaning is done thoroughly and at the proper time.

Apart from the routine cleaning, it should be the rule to clear up spillages and other accidental messes promptly; this helps to prevent grease spots forming on floors and walls, saves accidents and lightens the work of routine cleaning.

This booklet cannot lay down precise time-tables for cleaning, since the amount and frequency of cleaning necessary depends on a variety of circumstances—the location and immediate surroundings of the premises, the nature of the trade, the lay-out and decoration of the working rooms and the structural materials. The advice which follows will, of course, be adapted by the caterer to his own establishment.

Floors. The floors of the kitchen, food preparation room, washing-up room and dining room should be cleaned every working day. The manner of cleaning must necessarily depend on the surface, but all washable floor surfaces in these rooms should be washed at least once a day, preferably with hot water, soap or other detergent, and a scrubbing-brush, mop or squeegee. This washing should be supplemented by sweeping, as often as necessary, preferably with the aid of damping agents.

All floors of the kinds recommended on pages 9 and 10 for kitchens are capable of being washed and should be washed; but there are many catering establishments where the floors are bad and where, pending repair or relaying, constant washing would only lead to more rapid deterioration. Old wooden floors would be better waxed or polished than washed.

As a general rule, floor cleaning (particularly of a kind which may raise dust) should be carried out when there is no uncovered food in the room; a large kitchen can, however, be cleaned in sections. Before the floors are scrubbed any duckboards and other movable furniture should be removed in order to provide a clear room; the duckboards should themselves be scrubbed with hot water and a detergent once every working day. For small and medium-sized floors scrubbing with a hand scrubbing-brush and wiping with a floor swab is most efficient; for larger areas it may be necessary to use a long-handled brush and a squeegee. In most instances this floor-washing is best done either at the end of the day or at the beginning, long enough before the arrival of the cooking staff (or customers) to enable the floor to dry. Dining-room floors should not be swept while food is being consumed, unless a damping compound is used, the sweeping is done by sections and the section being swept is screened off from the part open to the public.

Floors in pantries, larders, dry food stores and vegetable stores should be swept daily and washed at least once a week. The duckboards forming the lowest shelves should be cleared and moved out so that the floor beneath them can be washed. In most instances more frequent washing than once a week is desirable.

Fixed carpets and matting in dining rooms, passages and stairways should be brushed or swept every working day, preferably by vacuum cleaner. Loose mats and rugs should be cleaned in a similar manner, and, if they are not vacuum-cleaned daily, they should be taken out into the open and beaten at least once a week.

Walls, Ceilings and Fixtures in Working Premises

Walls and fixtures should be cleaned frequently—not less than once a week—and their accessible parts should be dusted every working day. The method of wall cleaning must depend on the nature of the surface, but, wherever prac-

ticable, the walls should be washed with warm water and a detergent. The ceilings should be brushed or swept, and, when this is done, the dust should be removed from the top sides of girders and piping, from the ledges above windows and doors, from electric lighting and other fittings and from ventilation hoods.

At least once a week the interior surfaces of ventilation hoods should be wiped clean.

In inexperienced or irresponsible hands dusting often consists of shifting dirt from one undesirable resting place to another. It should be impressed upon cleaners that the purpose of their employment is not to flap dust into the air but to expel it from the premises altogether. Frequent and regular cleaning is, of course, the easiest way to keep the place clean. There is no doubt, also, that the quickest and most certain way to collect dirt and take it away is by means of the vacuum cleaner.

Kitchen tables and counters and preparation slabs. All surfaces used for food preparation (including cutting boards and pastry slabs) should be washed at least once a day and, in many cases, more frequently. Wooden and marble surfaces should be scrubbed with scrubbing brush, hot water and a detergent; stainless steel and other metal surfaces should be washed with a hand swab, hot water and a non-scratching detergent. After this washing they should be rinsed in clean water. In addition to this daily washing, the surfaces should be wiped with a clean cloth after each use. The framework, including the under sides of tables, should be dusted or brushed daily and cleaned thoroughly at least once a month.

Shelves and cupboards. Where these are used for storing food or utensils in constant use, they should be cleared once a week and cleaned; the routine of this cleaning should include the dusting (or sweeping) of the walls, the scrubbing of the upper surfaces of the shelves and the dusting of the under surfaces. Cupboards used for long-term storage (of reserves of linen and crockery, etc.) should be cleared out and cleaned at least once a month.

Meat block. This should not be washed, as water weakens the joints and softens the wood. Immediately after use the surface should be scraped and then treated with salt in order to prevent the moisture from the meat soaking into the wood. When the surface becomes worn or uneven, it should be planed to a new surface; if this is impracticable, the block should be discarded and replaced by a new one.

Weekly cleaning. To supplement daily routine cleaning it is a good plan to have a thorough cleaning of the working premises once a week on some suitable occasion after the dining room has closed. The rooms should be cleared in turn of all easily movable articles, and all food should be put away or covered.

The weekly cleaning is a good time to turn out cupboards and drawers, to throw out articles which have no business in a kitchen and to see that misplaced equipment is returned to its rightful place. A regular clearance of this kind prevents the accumulation of rubbish and unnecessary lumber and therefore helps to make cleaning both easier and more effective.

Dining-rooms. Circumstances vary so greatly that it is impossible to give detailed advice here. Chairs and tables should certainly be dusted thoroughly at least once every working day; and, unless table-cloths are used, table tops should be scrubbed or washed daily, and wiped, with a clean cloth, after each customer. Walls, ceilings and fittings, including electrical fittings, should be swept or dusted at least once a week and cleaned more thoroughly at least once a month.

Passages and staircases. In general, passages and staircases used for the transport of food, whether uncooked or in transit to the dining room, should be regarded, for cleaning purposes, as part of the working premises. Passages and staircases used only by the customers should be regarded as part of the dining-room, but will probably require rather more frequent cleaning. Meter cupboards and other miscellaneous non-food cupboards under stairs and in odd corners should be swept out at least once a week and cleaned more thoroughly at least once a month.

Lavatories, cloakrooms and rest-rooms. These should be kept very clean. In general, the cleaning schedule for the kitchen should apply to these places.

The yard, and any other open space belonging to the catering premises, should be kept clean. The yard should be swept and hosed down at least once every day. The rubbish collected by sweeping should be put into the dustbin before the hosing; on no account should grids or gratings be removed in order to allow rubbish to be washed down the drain—the purpose of the grid is to keep such rubbish out of the drain.

Equipment

Nearly all articles of equipment used in the preparation of food for consumption in a catering establishment can be included in one of three classes:

- receptacles in which food is mixed or cooked;
- implements with which food is cut, scraped, basted or otherwise treated or handled;
- machinery, whether hand or automatic.

The general principle with all equipment is that all surfaces which come in contact with food, or with hands that come into contact with food, should be cleaned after use. Other surfaces should be cleaned at least weekly. New equipment should be cleaned before it is put into use.

The cleaning of most receptacles and implements has already been discussed (pages 52-54). All articles which are small enough to be cleansed and sterilized by the two-sink method, either in the normal wash-up or in the pan-wash, should be so treated.

Boilers, coppers and large milk containers should be scoured inside, and then sterilized with scalding water or steam, immediately before use.

The tops, sides and shelves of stoves should be washed daily with hot water and a detergent, and the insides should be thoroughly cleaned—brushed and wiped—once a week.

Tea and coffee urns should be emptied and cleaned out after each day's use; clean, hot water should be poured into the container and the interior surfaces brushed with a long-handled, stiff-bristled urn brush; the water should then be emptied and the brushing repeated with fresh hot water; a third filling of clean hot water should then be put in and left overnight. If the urns are in daily use, they should be cleaned more thoroughly twice, or at least once, a week. For this, the outer jacket should be filled three-quarters full of water and the heat turned on; the container should then be filled three-quarters full of water with an urn-cleaning compound, and left, with the heat full on, for half an hour; the insides of the container and the cover should then be scrubbed with a long-handled, stiff-bristled urn brush and the water drained off. The pipes, taps and fittings should then be brushed, the brushes being run through all tubing. The container should be rinsed and brushed three or four times until the urn is thoroughly clean and free of all foreign flavours.

Savoy Bags. It is best to use paper piping bags and to throw them away after use. If cloth bags are used, they should be turned inside out after use

and rinsed thoroughly in hot water. Both insides and outsides should then be scrubbed with hot water and a detergent ; the bags should then again be thoroughly rinsed in hot water, sterilized in boiling water for three minutes, wrung out and hung up to dry. The nozzles should be thoroughly scoured in hot water until all grease is removed and then sterilized in boiling water.

Machinery

The extent and nature of the cleaning necessary must depend on the design and purpose of the machine. The instructions of the manufacturers should be followed, but, in general, the rule should be that every machine should receive some cleaning after each day's usage. For the purposes of cleaning, the parts of a machine can be classified under three headings :

- parts which come into contact with food ;
- mechanical parts which do not come into contact with food ;
- structural or covering members.

All parts which come into contact with food—knives, grinders, platforms on which food rests, interiors of bowls—should be cleaned thoroughly after each usage ; in many machines these vital parts can be readily detached for washing and sterilizing. At the least, they should be wiped clean of all food particles, washed in hot water and dried. If possible, they should be sterilized.

The cleaning of the mechanism is, in many cases, the work of the maintenance engineer rather than that of the operator ; but it must be remembered that the proximity of human food requires that those parts should be kept a good deal cleaner than is necessary for efficient performance. Any dust or dirt which might be blown or dropped on to food or surfaces which may contact food must be promptly removed.

Most of the materials used for the structural or covering members of machines—wood, iron, chromium, aluminium, stainless steel, enamel, tin, heat resistant glass—can be washed with water. Such parts should be dusted or brushed daily, and washed with hot water and soap or suitable detergent at least once a week. After being washed such parts should be thoroughly dried, and those surfaces which lend themselves to polishing should be polished with a clean dry cloth. The choice of a detergent is important, and it may be necessary to use different detergents for different materials. Coarse, scratchy scouring powders should not be used on chromium or stainless steel and only the finest scouring powders should be used on enamel or tin. Detergents containing strong alkali should not be used on aluminium. Indeed, for all those structural materials a mild soap is probably the most effective detergent.

Caustic soda, cyanide and other poisonous compounds should not be used for cleaning or polishing any equipment in a catering establishment. It is always dangerous to have poisons near food, and it is safer to use harmless alternatives for cleaning.

Cleaning Utensils

The utensils used for cleaning should themselves be kept clean. Scouring cloths, swabs, dish-cloths and dusters should be boiled in hot water and soap powder after each day's use. If hung out to dry over-night, they will be ready for use next morning.

Scrubbing brushes should be washed in clean hot water and detergent after each day's use, rinsed in clean hot water, rested on the bristles until completely drained and then dried in a warm atmosphere. Mop heads should be washed and rinsed similarly and then hung up to dry.

Scrubbing pails should be rinsed out in hot water after use and stood upside down when not in use ; cleaning solution or water should not be left standing in the pail after the cleaning is completed.

Inspection. The efficient catering manager arranges his time-table so that all branches of the establishment and all aspects of the work come under his eye at intervals which, although frequent, are not so regular as to encourage "window-dressing" by the staff. Inspection for cleanliness should be both thorough and comprehensive, and, so far as premises and equipment are concerned, it must necessarily be confined to certain times of the day ; so far as hygienic practices are concerned, the catering manager should regard himself as on inspection duty whenever he is on the premises. For premises and equipment, it is desirable to compile an Inspection Routine Chart setting out in detail what is to be examined in each room ; and a regular tour of the premises should be made and each item ticked off on the chart. Such a tour should be carried out daily in a small establishment and at least twice a week, in daily instalments, in a larger one. A manager who normally delegates this inspection round to a senior member of the staff should make the round personally at irregular intervals. If the staff consists of carefully-selected, responsible people, the cleanliness inspection should become a pleasure ; but it should not for this reason be regarded as an unnecessary formality. It is unfortunately the case that many catering operatives do need strict supervision in matters of food hygiene. In a large establishment such supervision has necessarily to be delegated to senior employees, but the manager should never delegate food hygiene supervision completely.

A FINAL WORD

Catering establishments are of many types, and not all have a ready source of information and advice. It is, therefore, worth while to point out that the local sanitary inspector is not solely an inspector ; he is well versed in matters of public health, competent to give the caterer advice on problems of structure, equipment and practices. He should be welcomed as a friend, and his advice should be freely sought.

MINISTRY OF FOOD PUBLICATIONS

Manual of Nutrition

(THIRD EDITION)

Sets out the elementary principles of nutrition for students and others who need a sound basic knowledge of the subject.

Price 2s. By post 2s. 1½d.

Ready Reckoner of Food Values

Analysis tables prepared for the benefit of School Meals Organizers, and others concerned in large scale catering, giving protein, fat and caloric values of foods in most general use.

Price 2s. By post 2s. 1½d.

Hygiene in Catering Establishments

Report of the Catering Trade Working Party

This report makes recommendations as to the precautions that should be taken to secure sanitary and cleanly conditions in catering trade establishments.

Price 1s. 9d. By post 1s. 11d.

Obtainable from

HER MAJESTY'S STATIONERY OFFICE

at the addresses shown on cover page iv
or through any bookseller.



MINISTRY OF FOOD BULLETIN

The Official Organ of the Ministry of Food

This journal, which is published every Saturday, gives you a compact summary of the news and the background on food.

- It contains the text of Official Announcements on food and allied subjects, and a comprehensive diary of Parliamentary News, including answers to questions and summaries of debates.
- It also supplies statistics about food consumption levels, subsidies, etc., and the latest information about domestic rations and catering allowances, foods controlled by Maximum Price Orders and much statistical material unobtainable elsewhere.
- Each issue contains at least one authoritative feature article of technical and general interest to all who are concerned with the production, handling and distribution of food.

Price: 6d. per copy

By post 7½d. or 30/- annually (52 issues) post free.

The Ministry of Food Bulletin can be ordered through any bookseller or newsagent or direct from

H. M. STATIONERY OFFICE

at the addresses shown overleaf

Crown Copyright Reserved

PRINTED AND PUBLISHED BY HER MAJESTY'S STATIONERY OFFICE

To be purchased from

York House, Kingsway, LONDON, W.C.2 423 Oxford Street, LONDON, W.1
P.O. Box 569, LONDON, S.E.1

13a Castle Street, EDINBURGH, 2 1 St. Andrew's Crescent, CARDIFF

39 King Street, MANCHESTER, 2 Tower Lane, BRISTOL, 1

2 Edmund Street, BIRMINGHAM, 3 80 Chichester Street, BELFAST

or from any Bookseller

1953

Price 2s. 6d. net

PRINTED IN GREAT BRITAIN

S.O. Code No. 68-6*