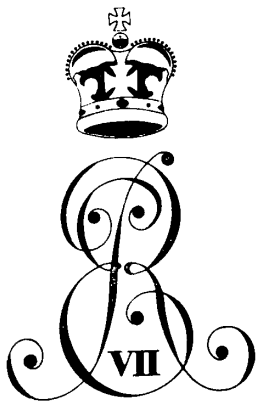

King Edward's Hospital Fund for London

CATERING ADVISORY SERVICE

An EXPERIMENT in MECHANICAL POTWASHING

at

BOTLEY'S PARK HOSPITAL

prepared by

G J Stormont FHCIMA FCFA Catering Adviser
J F Harvey MHCIMA FCFA Deputy Catering Adviser.

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INTRODUCTION

The Experiment

1 The washing of pots and pans is a task disliked by most people. Whilst in a small hospital only part of the day is taken up in this work, in a large hospital at least one person will be occupied the whole day on washing pots and pans in a hot, steamy and generally unpleasant atmosphere. It is stated in the DHSS Abstracts of Efficiency studies that 50% of all the time spent on cleaning in the kitchen is spent on pot washing.

2 A further reason for undertaking this experiment is that the standard of hygiene normally achieved in a hospital may be well below that which is desirable. It was therefore decided to carry out an experiment in the mechanisation of pot washing.

The Hospital

3 The experiment took place in Botley's Park Hospital, North West Surrey Group HMC because it had some 1200 mentally handicapped patients and was also supplying meals to St Peter's general unit and a maternity unit totalling approximately a further 500 patients. Cross infection was thought by the hospital officers to be a distinct possibility. Including staff at midday there were nearly 2000 people taking meals and pan washing was often undertaken by patients.

The Machine

4 The Dawson 'Plongette' machine which was chosen and was designed to wash trays, baking tins, saucepans and kitchen utensils. It operates on the principle of high pressure jets of water striking the various surfaces of pots. It is a timed operation which can be varied from 1 - 12 minutes for the wash and 1 - 6 minutes for the rinse. Temperatures are normally set for 140°F and 180°F respectively.

A detergent is incorporated with the wash water. (Details Appendix A).

The King's Fund made a grant of £4500 for the purchase and installation of the machine.

POT WASHING OPERATION

Pre-mechanisation problems

5 The kitchen at Botley's Park was comparatively modern with a reasonable standard of equipment and the pot washing area was laid out and equipped to the usual standards, having a double compartment sink with draining board either side, one sink having steam injection, a table for dirties and pot racks for clean utensils. The layout is shown in Appendix B.

6 The turnover of units was approximately 46 large pots, 102 medium and small pans and approximately 10 utensils per day. With the exception of approximately two dozen containers for ward trolleys, all the items were from the kitchen.

7 In addition a dozen or so insulated food boxes were wiped over by the staff on duty in the pot wash.

8 Staff were on duty in the pot wash 7 days a week from 09.00 hrs to 20.00 hrs including the usual breaks. But there were times when a later start than 09.00 hrs was made as the principle accepted by the hospital was to ensure that all vegetables were prepared on the day of consumption rather than the previous day. However whilst this was a sound policy for vegetable preparation it resulted in under-manning of the pot wash.

9 A study of 6 days indicated that the average man hours spent on pot washing was 9 hrs 26 minutes per day, equivalent to more than 66 hours per week (Appendix C).

10 The standard of washing varied to some extent. This may be due to the type of staff employed on this work, most of whom were Italian or Spanish who sometimes appeared not to understand England. Some of the incidents observed during the survey were:

a) Wash water left unchanged for too long resulting in grease and food soil collecting in considerable quantities in the water.

b) Rinse water too cool: sometimes the operator could hand lift items out of the water. On three occasions only was it observed that the water was of sufficiently high temperature to necessitate using a hook.

c) Pans re-used without washing or washed by the cooks because of insufficient porter staff or staff engaged on vegetable preparation. In the former case the pans had been used for bacon or sausages and were going to be re-used for roasting. However the pans had lain around the kitchen for sometime before being re-used.

d) Soiled pots and pans were often left overnight in scullery because it had not been possible for the staff to wash them in time for closing of the kitchen at 20.00 hrs.

e) Utensils greasy to the touch even though rinsed.

f) Pans sometimes not cleaned in the corners where a build up of carbonised food had taken place.

11 This pot washing operation is typical of a large number of hospitals where staff for this work is always difficult to recruit. The environment is not conducive to attracting good staff (see picture opposite), a hot steamy atmosphere, water swilling around the floor dripping off the operator's apron, soiled food pots and pans lying around, and a swill tub or basin nearby.

Post-mechanisation results

12 The pot wash area was replanned as shown in drawing (Appendix D). A crockery washing unit was also introduced into the area as in planning the mechanised operation it was realised that with a maximum cycle of 16 minutes (12 minutes wash 4 minutes rinse) the operator would be under utilised. The scraping, sorting and assembling of pots and pans could be done in less time than the average cycle. So to ensure he was fully employed it was decided to wash the crockery from the staff dining room in the same area with the pot-man assisting in this operation also.

Usual Hospital System

13 Apart from these two machines a hand wash basin and a hot air hand drier were installed. The pot racks were changed to mobile racks. Steam extraction direct from the machines was also introduced.

14 After initial staff instruction (Appendix E) with this newly equipped unit the output of pots, pans etc washed increased to 98 large pots, 187 medium and small pans and approximately 47 utensils per day. This larger number being washed were additional units from the ward conveyors at Botley's Park. All the insulated boxes are now washed at least once a week. A proportion of food containers from the wards now go through the machine every day. Oven shelves, the grids from the deep fat fryers, lids and drain pans, mixer bowl trolleys, all service and food machine attachments are also put through the machine and given a sterilising rinse.

15 The hours covered in the pot wash are the same as before but the actual man hours for the week on pot washing are reduced to 49 hours 23 minutes approximately, a saving of 16 hours 41 minutes.

16 The failings in washing up procedures as observed for the manual operation have been overcome.

a) The wash water is automatically renewed, grease and soil particles no longer build up in the wash water as it is filtered continuously.

b) Temperatures are automatically maintained with the rinse at 180°F.

c) All pans without exception are now washed after use and cooks never have to spend time washing a pan.

d) A build up of dirty containers is soon cleared and the scullery always free of dirty pots before staff going off duty at 20.00 hrs.

e) Utensils always feel clean and free of grease film.

f) The accumulation of carbonised food and fat deposits particularly in the corners of pans is gradually being reduced and all pans are becoming much cleaner.

Hygiene

17 Manual pot washing can achieve acceptable results providing a sanitising rinse is correctly used. In this particular experiment the bacteria counts were not bad enough for condemnation as indicated by the tests conducted by Dr B Hobbs of the Public Health Laboratory. Nevertheless there was a noticeable improvement with machine washing. It is considered that this is attributable to machine operation being automatic and therefore obviating the human failing of omitting to give a high temperature rinse.

18 Bacteriological examination of swabs of containers washed by hand and of wash and rinse water samples gave the following results:

(i) Plate counts at 22° and 37°C were similar but covered a very wide range: some results were very unsatisfactory.

(ii) Coliform bacilli (non-faecal and faecal) were isolated from wash water (1800 +/100ml), rinse water and washed containers.

Bacteriological examination of swabs of containers washed by the machine and of wash and rinse water samples gave the following results:

(i) Plate counts at 22° and 37°C were similar and always low in number.

(ii) Coliform bacilli (non-faecal) were isolated on only two occasions.

Machine washing was therefore much more efficient in removing micro-organisms from pots and containers.

Detergent

19 While the amount of detergent used can be measured, the brand, type, cost and dilution rate can vary from hospital to hospital. Unless the same detergent is used in every hospital a comparison of running costs can be misleading.

20 In this particular hospital, prior to the introduction of machines, a porter poured detergent into the pan wash sink making a rough guess at the amount required.

As there was no measure it was impossible to say if there were too much, too little or exactly right proportion of detergent to water. Nevertheless by checking with kitchen requisitions it was estimated that approximately 3 gallons of liquid bacteriacidal detergent per week was used and the cost was £2.40 or approximately £124 per annum.

21 When the 'Plongette' pot wash and crockery washing machines were installed they were fitted with electronic measuring and dispensing controls to ensure the correct concentration of detergent in the wash tanks of the respective machines. A liquid detergent suitable for softened water supplied by the hospital was purchased. Based on a trial period with the controls set to maintain a detergent solution strength recommended by the detergent manufactuers, the following consumption was recorded.

'Plongette'	1 gallon 0.9 pints per week	cost per annum £140

FURTHER DEVELOPMENTS

22 Observations of the pan washing operation indicated that the machine was in use from 09.00 hrs until 16.00 to 17.00 hrs. In this period there were at least 1½ hours when no operator was in attendance. Two 15 minute breaks and an hour when the operator was required for other duties plus his lunch break. There were items to wash after 17.00 hrs, but no great quantity.

23 To put the pan wash machine and the dishwashing machine to greater use during the opening hours of the kitchen and to improve hygiene standards for the washing of dishes and containers from St Peter's hospital wards it was decided by the HMC Group Catering and Domestic Managers to transfer work from the ward domestic staff to the central kitchen.

24 With this increased work it became necessary to appoint a supervisor to control the operation of the machines and it was resolved that the Domestic Supervisor would be responsible for manning and maintaining the organisation of the unit although the Catering Manager would second one of his staff to the unit.

25 Under the new organisation the hours covered were from 07.00 to 21.00 hrs. The system evolved for the collection and return of crockery to wards is described in Appendix G.

Cost Comparison

26 A comparison of the estimated costs of crockery washing at St Peter's Hospital are as follows:

Ward Washing	£ 5418 per annum
Centralised machine washing	£ 3454 per annum

The use of detergent between the two systems is estimated to be about the same.

CONCLUSIONS

27 The introduction of the 'Plongette' washing machine has made it possible to provide a better service in the kitchen with a better standard of cleanliness, all pots and pans being washed thoroughly and given a sanitising rinse, the bacteria count being considerably reduced. Far more items are now being washed, and apart from the direct savings of man hours in the kitchen, there has been an indirect saving at ward level with a reduction in possible cross infection. Because of the better environment for staff it should facilitate staff recruitment and retention of good staff. Nevertheless to ensure that these benefits continue it is essential to see that a good planned service for the machine is maintained.

28 It is considered that the benefits derived are well worth the expense involved.

Appendix A

Details of 'Plongette' Pot Washing Machine

The machine covers an area of 7'10" ft x 5'9" ft approximately. The rack has a useable area of some 9 sq ft. Some examples of full loads are:

Load 1 — 12 x ½ size standard PC Bain Marie containers plus
6 small sauce pans, hand bowls or 1 pint measures

or

Load 2 — 1 x 80 qt mixer bowl plus whisk or beater
4 x 40 qt mixer bowl
4 x 3 gallon measuring buckets

or

Load 3 — 9 insulated food container delivery boxes ($13\frac{1}{4}$" x $12\frac{3}{4}$" x 21")

or

Load 4 — 8 large food containers for insulated boxes
4 third size food containers for insulated boxes

Suitable safety arrangements have been built into the machine so that the drive mechanism should not be damaged if a pan jams in the moving jet assembly. The door mechanism when operated by mistake will immediately shut off the pumps.

If a high standard of washing is to be maintained weekly checks of the wash jets for blockages is necessary as it is inevitable small particles of food will be sucked through the filters. It is also desirable that the hospital maintenance department should stock a small amount of spares. Failure to do this can cause disruption in the kitchen should the machine break down. Regular routine maintenance is essential. This should be arranged with the manufacturers unless the hospital planned maintenance schedules can include the tasks which the manufacturers staff would otherwise carry out.

Appendix C

Comparison of man hours incurred daily for kitchen pan washing

By hand

Day	1	2	3	4	5	6	mins
Filling & emptying sinks	19	20	20	30	32	37	158
Washing, cleaning	437	507	507	613	509	536	3109
Cleaning wash up, floor etc	8	36	9	29	19	30	131

total mins 3398

per week 66 hrs 4 mins

By machine

Day	1	2	3	4	5	6	mins
Switch on & fill machine	15	20	14	30	30	30	139
Hand rinse	6	30	18	15	60	16	145
Scrape pans, load & unload machines	229	366	251	396	340	326	1908
Clean machines	56	42	45	45	35	41	264
Clean wash up, floor etc	15	10	10	10	25	14	84

total mins 2540

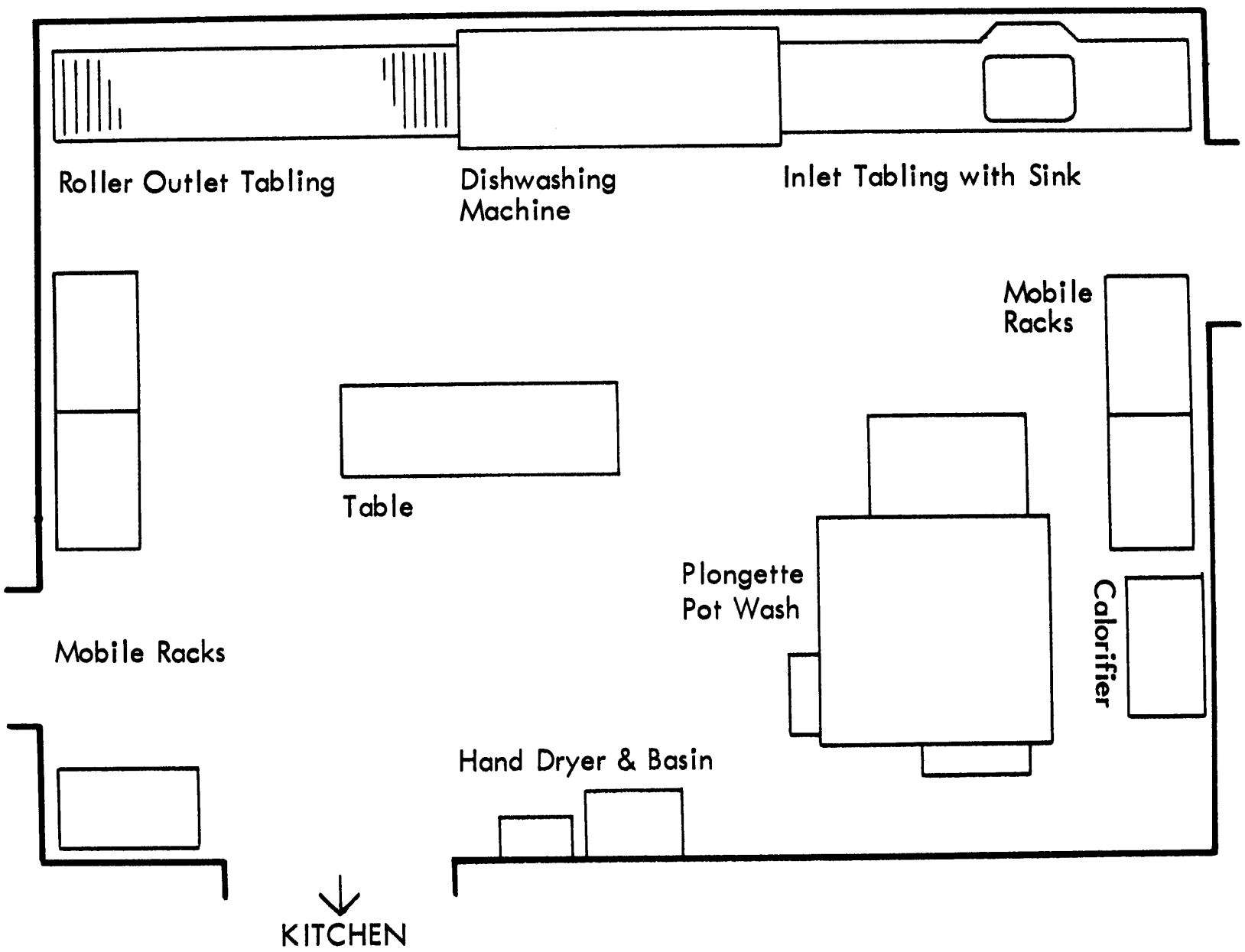
per week 49 hrs 23 mins

MAN HOURS SAVED per week is estimated to be 16 hrs 41 mins approx

at standard wage rates this is equivalent to £6.69p or nearly £350 per annum

If overtime rates are taken into consideration such as for Sunday work this figure would be higher.

Appendix D



NEW POT WASH LAYOUT

BOTLEYS PARK HOSPITAL KITCHEN

Scale One Inch to Four Feet

Appendix E

Staff Instruction

It is necessary to instruct staff in the use of the machine to obtain optimum efficiency combined with satisfactory results.

1 Pots, pansand utensils must be sorted and placed in groups so that heavily soiled are separate from lightly soiled, big pots from small pots, and utensils in a separate group.

2 Pots and pans heavily coated should be scraped and loose food removed before putting them into the machine.

3 The use of baskets for small items is essential to avoid some falling through the rack and jamming the spray units.

4 The time cycle of the machine must be adjusted to suit the particular group being washed.

The suggested procedure is as follows:

Preparing Machine

1 Close drain valve

2 Position strainers and filter grids

3 Turn on fill valve and close it when tank is full

4 Turn on detergent control

5 Ensure detergent supply is adequate for day's work

6 Turn on mains switch

If hot water is used the machine will be ready in a few minutes. If cold water is put into the tank allow about 45 minutes

Prior to Loading Machine

1 Sort pots and pans into three groups, large, small, and very small including kitchen utensils

2 Taking each group scrape and remove loose food and at the same time separate heavily soiled from lightly soiled. Small items and utensils should be placed in wire baskets

3 Set time control to suit group being washed

Heavily soiled - 6 to 12 minutes with 4 minute rinse

Lightly soiled - 2 to 4 minutes with 4 minute rinse

NB Only experience can teach the exact time settings.

End of Service

1 Turn off mains switch and heater valves

2 Open drain valve and allow all water to drain away before removing strainers and filters

3 Remove strainers and filters, scrub away all adhering particles in sink

4 Clean inside the machine and loading apron of all particles and grease by using hose attached to the machine

5 Return strainers and filters to correct position and clean outside of machine

6 Leave machine with door open to dry

Appendix F

Comparison of numbers of items washed in one day

Two days were picked at random, one pre-mechanisation and one post-mechanisation. From general observation it is considered that they are two typical days. The increased number of items shown in the 2nd and 3rd columns indicates that more pans are being washed by the machine than previously. Cooks unable to wait for pans often washed them quickly in a sink (para 10c) and other items were previously washed by a kitchen porter*, or even ward maids.

Pre-mechanisation	Post-mechanisation Machine	Rack	
	16		Bain Marie containers
3	8		Large bowls
3	6		80 x 40 mixer bowls
5	3		Large saucepans
4	7		Small saucepans
10		20	Spoons, ladles etc
8	15		2 gal stainless steel buckets
6	6		Colanders (large and small)
15	47		Large roasting tins 24" x 30" x 4"
	1		Mixer bowl trolley
		15	Lids to insulated containers
	2		Chopping boards
6	17		Insulated containers round
	12		*Deep fat fryer, grids, lids etc
2	7		4' spatulas
21	25		Steaming ovens trays
	4		*Wood duck boards
	4		*Wood steep stools
	1		*Wood stand 2' x 2' x 3' approx
	2		*G P kitchen trolleys
		10	Racks of crockery
34		30	Pie dishes - aluminium food containers
3		7	Conical strainers
2		2	Hand bowls
4	8		Mincer parts
2	4		Measuring jugs
	4	12	2 scale pans, scales & weights
4	7		Mixer attachments & beater sets
6	15		Small baking trays
20		25	Lids to aluminium food containers
158	221	111	

Appendix G

System for collection and return of crockery etc to wards

Food trolleys are cleaned in ward kitchens but food containers, used crockery, cutlery and serving utensils are packed into lightweight polythene boxes. These are collected by the transport used for distributing food trolleys by making an extra journey at the three main meal times. No extra staff or vehicles were needed.

Food containers, after being washed in the 'Plongette' machine are stacked in mobile racks.

The boxes of crockery are unpacked on the dishwasher tabling, loaded into dish racks. The boxes are washed first and the clean crockery repacked in the same box. The end of each box load being signified by the arrival of the next box at the clean end of the dishwasher. Thus counting and checking of ward crockery is avoided. Clean crockery is returned to the wards immediately a truck load is completed.