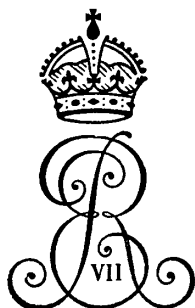


KING EDWARD'S HOSPITAL FUND
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NOISE CONTROL
IN
HOSPITALS

*A report of an enquiry into noise in hospital wards
together with suggestions for its control.*

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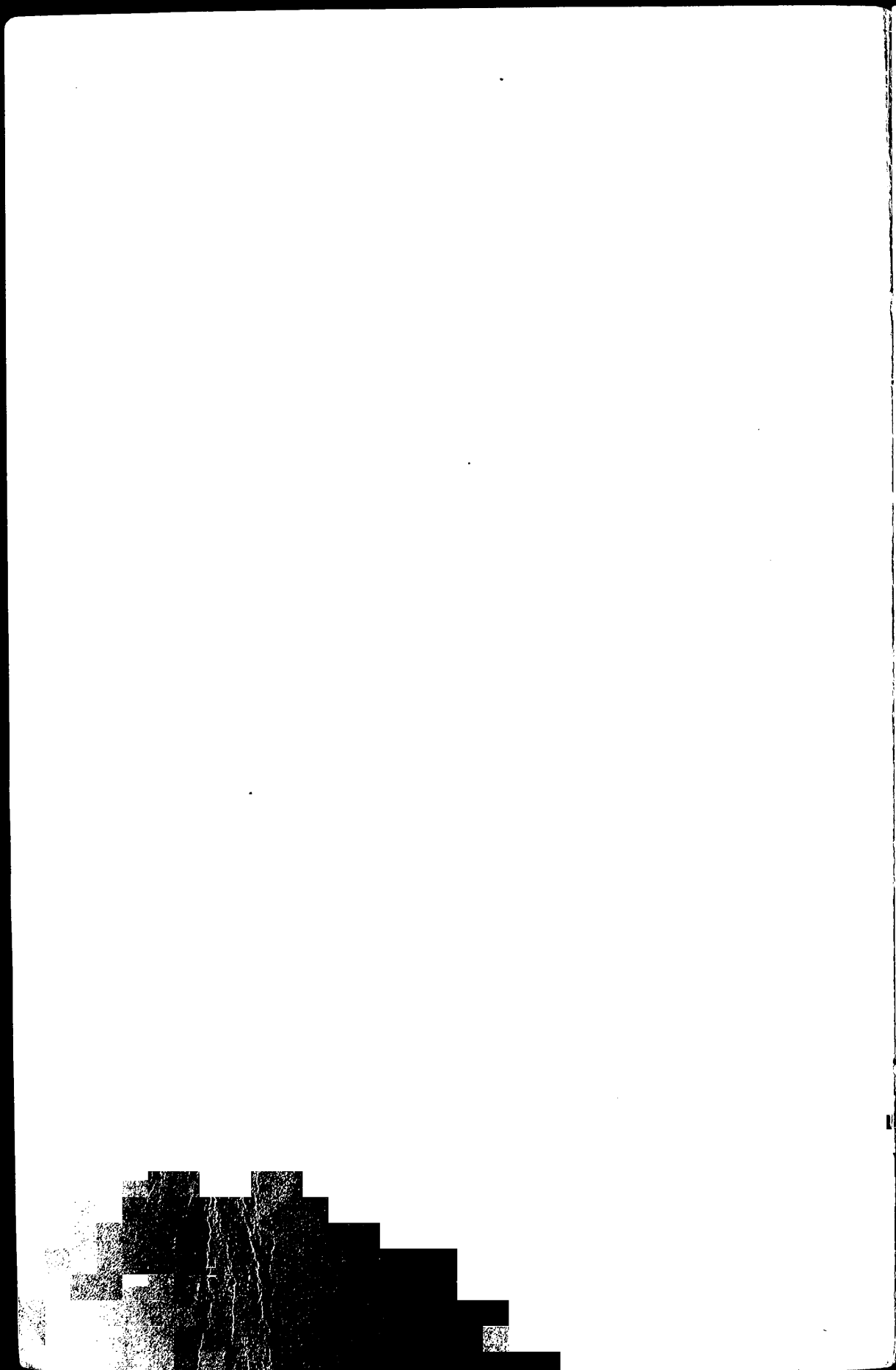
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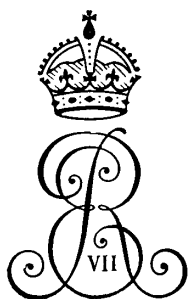
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NOISE CONTROL IN HOSPITALS

THAT the world is growing noisier is obvious to us all; towns, roads, buildings and even hospitals are all noisier than ever before. That noise is bad for us cannot be denied; it irritates and frays our nerves, but it is usually accepted with resignation in the hope that we shall soon become so used to it that we shall hardly notice it. This hope can be justified up to a point. For example, people a hundred years ago were horrified by a railway train rushing through the quiet countryside. Now, the rhythmic noise of a train is balm to our ears as compared with the shattering roar of a jet aircraft passing overhead.

When people are ill they are far more easily upset by irritating and unnecessary noises than when they are well, and it is therefore very necessary to control the noise in hospitals. This was recognised by Florence Nightingale when she recorded in her Notes that "Unnecessary noise is the most cruel absence of care which can be inflicted on either sick or well".

Many hospitals are already tackling the problem of noise control because of the realisation that this is important to patients' welfare and recovery. This paper records the experience of King Edward's Hospital Fund for London in connection with an enquiry into the noise problem at 15 hospitals, of which all but four are in London. It is a non-scientific paper which contains practical suggestions designed to reduce the noise of existing equipment and emphasises the need to impress these matters on the staff. While it is hoped that it may be helpful to hospitals, it does not attempt to deal with the problem of noise prevention in new building construction nor to suggest costly structural alterations which might well be impossible to make because of present financial restrictions. It is essentially a set of notes on practical and inexpensive ways of keeping down noise in hospital wards which Hospital Committees may apply to their own hospitals.

ENQUIRY IN HOSPITALS

The idea of finding out which particular noises in hospitals were most worrying to patients was considered by the King's Fund in 1956

and it was decided that the Visitors should make special enquiries during the course of their visits to London hospitals. The resulting comments, which were made by hospitals' staffs, referred more often than not to outside noises than to those emanating from within the hospitals themselves. There was, however, a general consciousness that hospitals were becoming rather noisy and that something ought to be done about it. At this point it began to appear that the staffs did not notice a good deal of the noise going on around them simply because they were there all the time and had become accustomed to it. With the patients who are ill and new to the wards, however, it seemed probable that the position might be quite different and that these noises might distress them very much.

Expert opinion was sought with a view to measuring the sounds inside the wards, with the idea of providing sound-deadening devices on walls and ceilings, if necessary. The noises thus measured were almost exclusively made by traffic outside the hospitals and the measurements, in decibels, showed only the volume of the sound with little indication of its pitch. Although it was realised that some practical sound-preventing measures to cope with this type of noise could be tried out, it was decided that a different approach to the problem was necessary. If, instead of measuring sounds scientifically, the patients were asked to say which noises chiefly worried them, it might be possible to identify the most irritating noises and then to prevent them from being made, or at any rate greatly to reduce their volume.

THE PATIENTS' VIEWS ON NOISE

It seemed clear that the nuisance value of a sound often bore little relation to its intensity by scientific measurement. For example, a small sound in the ward at night, such as the rattle of a bunch of keys in a cupboard door or the tapping of hard heeled shoes on the floor, often causes irritation to a sleepless patient who is recovering from illness or operation. The constant background noise, often substantial during the day but less during the night, was an important factor and was the datum level above which other sounds were measured in the minds of the listeners. Many patients will hardly notice the continuous rumble of traffic after a few days, but the sudden

roar of a noisy motor cycle will at once cause them irritation and annoyance.

With these ideas in mind hospital authorities were approached for their co-operation with a plan to question patients about the noises that worried them during their time in the wards. The hospitals readily agreed and it was arranged to hand all patients who were well enough a letter explaining that it was hoped to reduce the noise in hospitals, and that it would be much appreciated if patients would be good enough to comment on the noises they heard, in the appropriate section of the form provided. A copy of the form is printed at the end of this pamphlet (Appendix II) and it will be seen that there are four headings as to the type of noise: (i) Made by equipment, (ii) Made by people, (iii) From outside the ward, but inside the hospital, and (iv) Outside the building.

It was thought necessary to explain in the accompanying letter that the patients were not being asked to make complaints about the hospital and its staff but simply to state the facts as they saw—or rather heard—them and make any suggestions for improvements that came to mind.

COLLECTION AND ANALYSIS OF REPORTS

During the winter of 1957 and the spring of 1958 information was collected from over 2,000 patients in London hospitals as the forms were returned to the offices of the Fund for examination and analysis. It was found that a surprisingly large proportion of the patients had no comments to make, and although the proportion varied considerably as between one hospital and another, it was evident that nearly 50% were not bothered by noises. Other patients reported all sorts and kinds of noises, some within the hospital, which could clearly be dealt with; some reported outside noises which came from cats, jackdaws, tugs on the river and even a rifle range, none of which seemed to be very easy to stop. As was to be expected, a number of patients were evidently unconscious of, or indifferent to, noises which exasperated and fatigued others, perhaps a minority, but this minority deserves all the help and relief that good hospital administration can provide. Noises which were obviously unnecessary were particularly

tiresome to sensitive patients and it seemed these were the ones which should most urgently be tackled at source.

The analysis of the reports showed that most of the noises which disturbed patients arose within the wards, and that they could be stopped at source without great difficulty and at little expense. These included trolleys with squeaking wheels and rattling tops with equipment on them. Moveable screens and bed curtains on noisy runners figured largely, as also did banging doors without rubber stops and badly adjusted door springs. Ward kitchens came in for some criticism, particularly the noise of washing up crockery in metal sinks. Bedside lockers, stools and other furniture which had to be moved from time to time were reported as causing unnecessary noise.

As a result of these reports some hospital authorities, by careful maintenance routine and thoughtful and detailed alterations to existing equipment, have been able almost entirely to remove these sources of noise. In most instances the expense was small, or only involved the purchase of such things as polythene basins and rubber topped dustbins, etc. Some notes on this subject are contained in Appendix I.

There were a number of instances where patients were disturbed by the noise made by other patients either on account of illness or simply by snoring, but in either case no new solution came to light during the enquiry. Side wards or a partitioned section at the end of the ward seemed to be the most favoured solution to this perennial problem.

OUTSIDE NOISES

There were a number of reports of noises where the source was outside the ward but within the hospital precincts. Some of these were difficult to deal with on account of the type and layout of the buildings of particular hospitals. A common complaint was the noise of crates of milk bottles being delivered at the hospital and being unloaded onto a hard-surfaced yard. The suggestion that these crates should be plastic covered has unfortunately been rejected as impracticable. The provision of milk in specially treated paper containers, rather than in bottles, offers a possible solution to this

problem. One large dairy now provides milk in disposable paper containers as part of its regular delivering service. Progress along these lines may be expected to develop quite soon. At one hospital, where the oxygen cylinders were unloaded from a lorry onto the ground with considerable noise, the matter was put right by providing larger doormats on which to place the cylinders.

The noise of road traffic was mentioned by a good many patients, nearly always as an annoyance at night: during the day it seems to have been a fairly uniform background noise and caused little distress after the first few days. Practical measures against this nuisance, usually involving the fitting of sound-absorbing tiles, double glazed windows and other devices which entail considerable expenditure of money, are outside the scope of this paper. Another annoyance can be the chiming of church clocks during the night. One hospital, at least, has remedied this by requesting that the chimes should be stopped during the night. The provision of translucent plastic or rubber doors at strategic points can help to cut off unwanted noises, but these doors are rather expensive.

CO-OPERATION OF STAFF

Some of the noises, however, were made by staff, either by not having rubber-soled shoes or by loud talking or by using equipment in a noisy manner. This can be remedied as soon as staff, whether medical, nursing or lay, are made conscious of the need to avoid unnecessary noise and it applies not only to those who work in the wards but also to porters who will be moving oxygen cylinders, laundry baskets and other equipment on hand barrows. It is important to quieten all the equipment which staff are required to handle because they cannot be expected to go quietly about their work if they are given noisy equipment. Furthermore, they should be encouraged to report to the appropriate department any equipment which requires attention or servicing to maintain its quiet operation. Such reports must be regarded as serious, and attended to promptly. It follows that when new equipment is provided, enquiries should be made about its noiseless qualities. For some articles there is now a wide range of plastics from which to choose and they are quite satisfactory. A drawback to plastics is that they cannot withstand the heat needed

for sterilization, so their use is limited. Progress is being made quite rapidly in this field and it seems likely that before long suitable plastics may be marketed as a possible substitute for noisy stainless steel or enamel ware that has to be sterilized or autoclaved.

CONCLUSION

It will be seen from the foregoing notes that if hospitals are to be kept as quiet as they should be for the proper care and welfare of patients, there must be constant vigilance on the part of the staff. There must be closer co-operation between the nursing, administrative and maintenance departments and, because of the inevitable changes amongst the staff, these points must periodically be brought to their notice if a reasonable standard of noise-control is to be maintained.

Appendix I

The prevention of noise depends largely on a thorough maintenance routine of all moveable equipment which is normally used in or near hospital wards. Some hospitals have obtained good results by dealing with the problem on the lines set out hereunder. These suggestions cover the noises most frequently reported in the survey, but are not intended to be entirely comprehensive. Indeed, they cannot be since each hospital will have its own particular sources of noise.

DOORS

Regular maintenance of door hinges: oil, and tighten screws.

Provision of self-closing equipment carefully adjusted, so that the door just closes but does not bang: easy movement of the door must be achieved for convenience of entry and exit. Regular maintenance and cleaning of all door springs and catches.

The removal of door catches when they are not needed; this is often the case when self-closing equipment is fitted.

The fitting of small rubber strips to door frames, slightly recessed if necessary, so that when the door closes it strikes the rubber and not the door frame. This reduces the noise of the door closing. The outside rubber covering of disused electric twincore cable is excellent for this purpose and normally two strips, four or five inches in length nailed at the top and bottom of the vertical frame, give good results.

WARD SCREENS

Regular inspection and greasing of wheels—large wheels are better than small.

The application of ordinary hard yellow soap pressed into the sleeve type of metal hinges on the screens to act as a lubricant. Oil or grease is unsuitable because it is liable to mark the screen covers, and can be a nuisance when the screen is handled.

The fitting of small strips of tubular rubber, about twelve inches from the top of the vertical tubular sides of the screens, to prevent the metallic bang when the screen is closed.

The provision of screens with tubular frame base instead of wheels has often given good results.

TROLLEYS — TIER TYPE

Regular inspection, greasing of wheels, cleaning of tyres. Large sprung wheels are better than small wheels or castors.

Blockboard shelves covered with metal or plastic are more effective sound deadeners than plain glass or metal.

Complaints were made about the rattle and jingle of articles on trolleys when being wheeled about the wards and corridors.

Care should be taken in loading the trolleys, and the shelves must always be resting evenly on their supports. If the balance of the shelves is incorrect the articles will tend to slide together as soon as the trolley is moved. On many trolleys the shelves rest on four pieces of smooth rubber fixed to the horizontal tubular supports. With constant use of the trolleys, these rubbers, which are usually at each end of the side supports, tend to slide out of position and upset the balance of the shelves. In other types, the shelf can get out of balance by the turning of the rubber pads on the tubular supporting rails. Quite a slight movement causes misbalance, and it can only be detected by close inspection. An effective remedy is to stick four short pieces of ordinary corrugated rubber hose piping onto the side rails, one piece at each end. This prevents movement of the rests, and the corrugations of the rubber piping hold the shelves rigidly in place.

TROLLEYS FOR GENERAL PORTERAGE

Regular attention should be given to the wheels and tyres of these trolleys.

Three-wheeled trolleys or trucks are usually noisier than two- or four-wheeled conveyors.

Staff should be warned that it is better to do two journeys with a lightly loaded trolley than one journey with an overloaded trolley which bangs into walls and corners because it is awkward to handle.

The loading surface of trolleys can be covered with rubber mats (car mat type) to reduce noise and prevent the load from slipping. The corners of trolleys can usually be covered with rubber pads as protectors.

BEDSIDE LOCKERS

Regular inspection, greasing and cleaning of wheels.

When the wheels are unsatisfactory, good results may be obtained by fitting tubular metal skids.

CHAIRS AND STOOLS

Rubber ferrules on the legs make for quietness, but have the disadvantage that if this furniture is pushed along the floor it will probably fall over. Tubular metal skids give good results.

OXYGEN CYLINDERS

Regular inspection and greasing of wheels on cylinder trolley.

Rubber pads on parts of the trolley to deaden metal-to-metal clatter.

Provision of coir mats at the main unloading point.

WARD KITCHEN — STAINLESS STEEL SINKS

In order to reduce the noise of washing up crockery in stainless steel sinks, it is advisable to paint the underneath and sides of the sinks and the under-side of the stainless steel draining boards, with liquid rubber of the Underseal variety. This, in effect, lines the outside of the sink with rubber and reduces vibration.

The provision of polythene basins to be placed inside the sinks for washing up crockery.

Polythene plate and cutlery drainers. Cutlery can be stored and transported in inexpensive polythene containers.

DUSTBINS

Rubber dustbins are used with success in many hospitals.

If the expense of these articles is not acceptable, good results can be obtained by providing rubber lids for existing metal bins.

BED CURTAINS

The modern plastic track and runners for bed curtains are reasonably quiet, but (apart from questions of hygiene) they must be kept clean if the curtains are to run smoothly and silently.

TELEPHONE CALL SYSTEMS

Call systems and telephone bells came in for a good deal of criticism by patients. The flashing light system and the Wireless or Magnetic Induction Personal Call Systems have the advantage of being quiet in operation.

When siting new telephones, care should be taken to see that this will not result in patients being disturbed in the wards, particularly at night.

ELECTRIC CLEANERS

These should be tested for silence in operation before making a purchase, and thereafter regular maintenance is essential if they are to remain reasonably quiet.

FOOTWEAR

So many patients complained about the noise of people walking about in the wards that it is clearly an aspect of noise control which should receive attention. The most practical measures are (a) to bring it to the notice of the hospital staff, and (b) obtain the advice of a footwear specialist.

LIFTS

Many lifts have an expanding metal door which is noisy in operation, some of which were complained about by patients during this enquiry. The doors differ widely and it is not possible to suggest a definite remedy, but many hospitals have been able to devise improved operation.

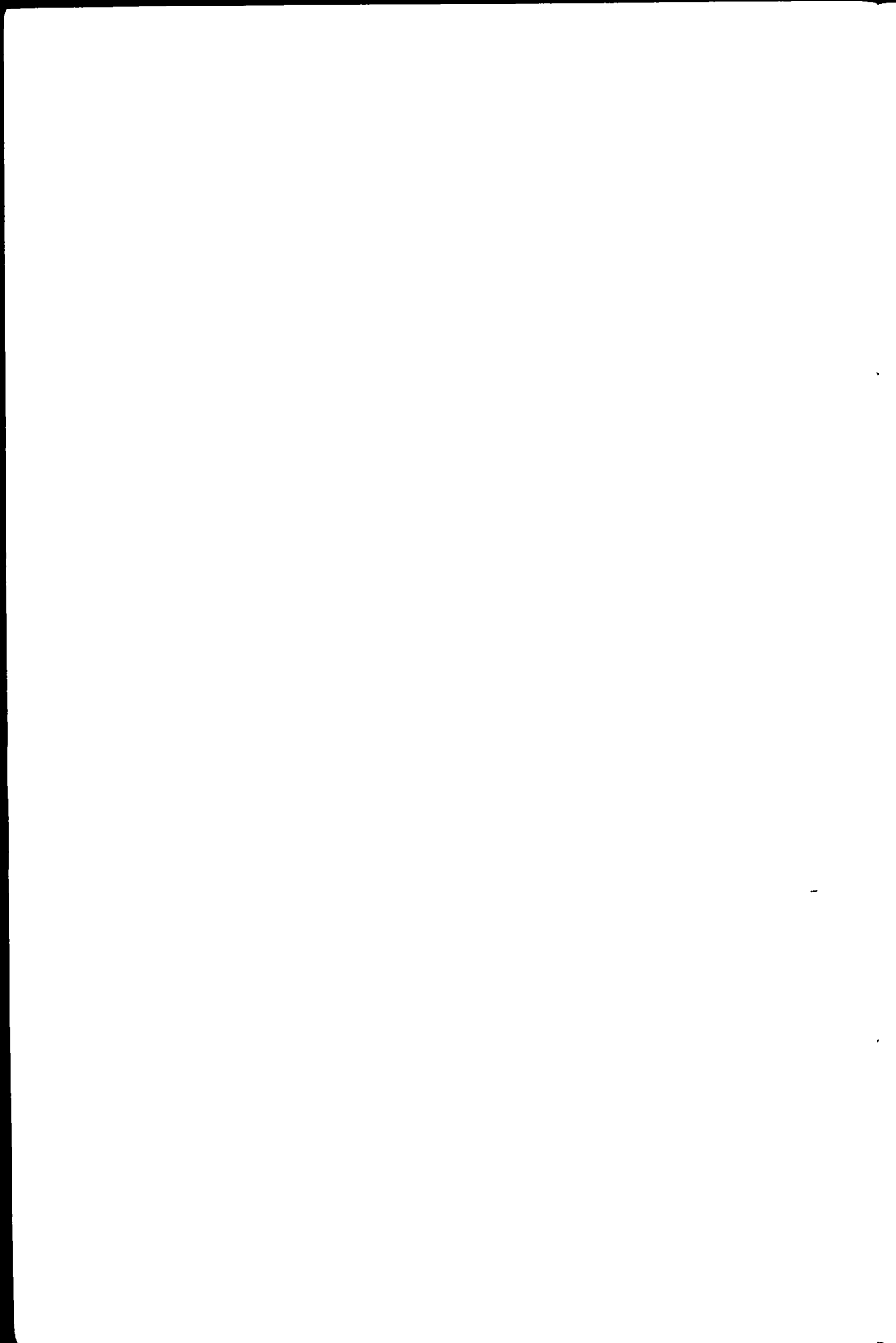
WHEELS

Whenever possible, wheels with grease nipples are preferred: grease is more effective and lasts longer than oil as a lubricant. Dust should not be allowed to collect on the tyres or bearings.

All wheels should be rubber tyred and it should be borne in mind that large wheels are more satisfactory than small ones.

POLYTHENE

The gradual replacement of metal utensils, such as trays, bowls and dishes, is worth consideration.



Appendix II

A form similar to this, together with a letter of explanation, was given to each patient who took part in the enquiry.

NOISE IN HOSPITALS

The noises that worry me most are:—

- (1) Those made by equipment: trolleys, doors, etc. Please state to which piece of equipment you refer, and whether the noise occurs by day or by night.

- (2) Those made by people: nurses, domestic staff, visitors, other patients, etc. Please state which type makes the noise, when and how, e.g. do they talk loudly, walk noisily, rattle things?

- (3) Those made outside the ward, in passages, etc.

- (4) Those made outside the building.

Ward:

Date:

Name:

(you need not sign this
unless you wish.)

II. THE PROBLEM

The problem of the origin of the universe is one of the most fundamental and important questions in science. It is a question that has puzzled philosophers and scientists for centuries.

THE PROBLEM OF THE ORIGIN OF THE UNIVERSE

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