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HINTS ON

THE

HOSPITALS.

Advocating their More General Use.

BY

EDGAR ENGLISH, M.R.C.S.,

Holder of the Certificate in Hygiene granted by R.C.P.Lond.

London:

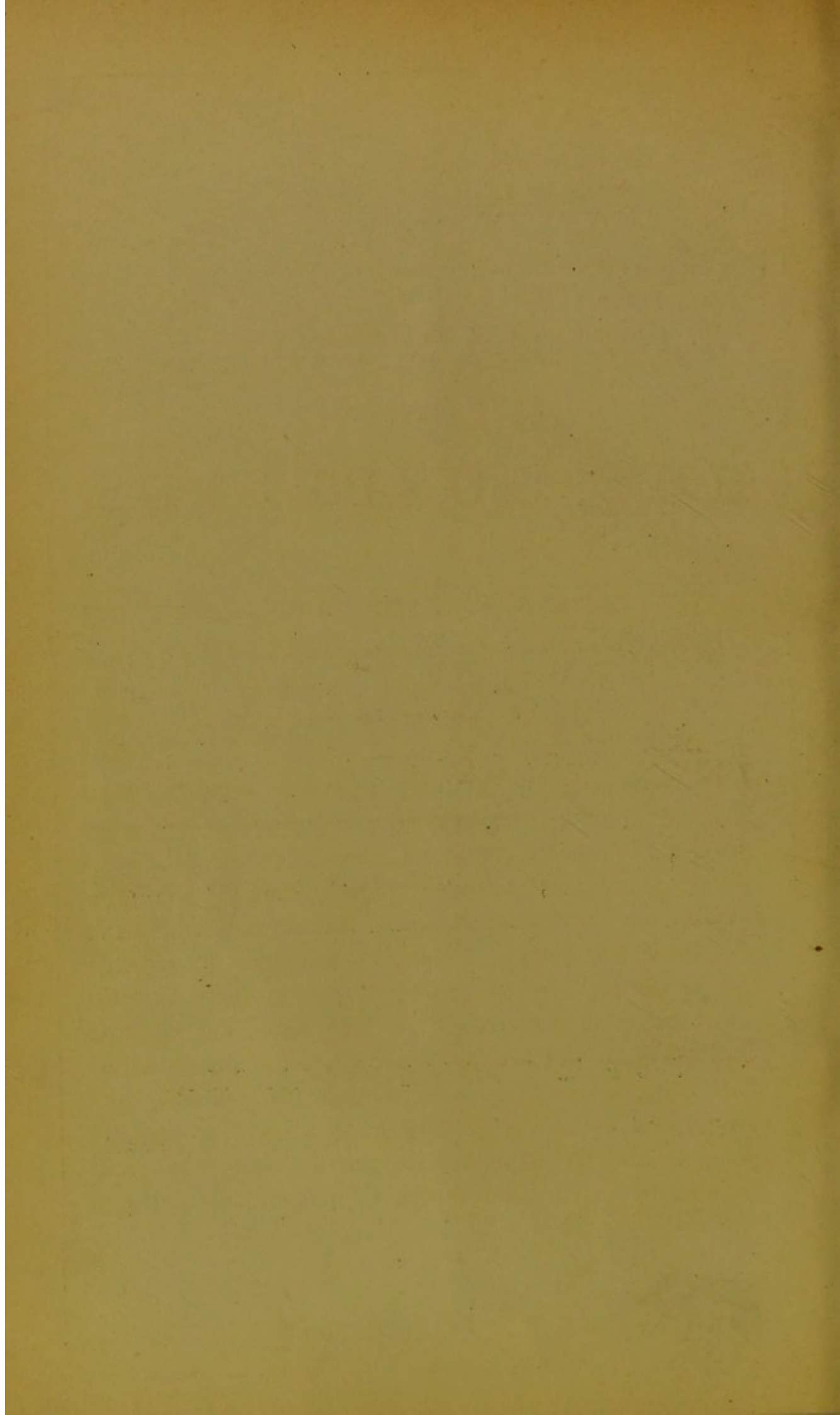
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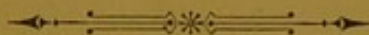
— ON —

HUT HOSPITALS.

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N days gone by but little attention seems to have been paid to the hygienic conditions of our hospitals—indeed, most of the large hospitals in England were founded when the main principles of sanitary science were unknown; and even since the setting in of the tendency to enlarge the buildings already existing, the sanitary reforms which have taken place within them have had much to contend with, and are often in a great measure counterbalanced by the excessive number of patients and attendants placed under one roof. Sixty or seventy years ago it was customary to look for some change or peculiarity in the season, or to particular modes of

dressing wounds, as the causes of various maladies born within the hospital. (*See Sir Astley Cooper's Lectures on Erysipelas.*)

At the present day, when hospital cases are not doing well, either no thought is given to the why or wherefore, or else some theory difficult to prove is put forward; whereas, without doubt, the real enemy is the presence of a noxious atmosphere whose poisonous elements—always hostile to the sick and wounded—too frequently frustrate the best-directed medical and surgical skill. The effects of breathing air laden with such impurities as are commonly found in large hospital wards “may be slowly and imperceptibly cumulative, but they are nevertheless injurious, and they are now recognised as being the most potent and wide-spread of all the predisposing causes of disease.”—*Wilson's Handbook of Hygiene*. “Moscatti, who (in 1818) condensed the watery vapour of a ward in Milan, describes it as being slimy, and as having a marshy smell. The peculiar smell of a hospital is indeed very remarkable, and its similarity in hospitals of different kinds seems to show that the odorous substance has a similar composition in many cases. The reaction of ozone is never given in such an atmosphere. The dust of a ward in St. Louis, in Paris, examined by Chalvert, was found in one experiment to contain 36 per cent. of organic matter, and in another 46 per cent.”—*Parke's Manual of Hygiene*.

In consequence of the impurities in the air within the walls of our large general and many special hospitals, the surgeon is often disappointed as to the results of his operations, and the physician also in the slow and

unsatisfactory progress of his patients, who, though discharged as cured, yet, being deficient in vital force, soon become an easy prey to fresh disease. Hence the necessity of convalescent homes. In fact, patients and their friends, hospital authorities and their officers, all suffer more or less, either in health, or, it may be, in pocket, from the difficulty, amounting almost to an impossibility, of securing a pure atmosphere within the wards of a huge many-storied structure full of sick persons.

But the hospital system in densely-populated towns, as at present carried out, renders such facilities for medical and surgical treatment, together with seeming administrative economy, that it is not likely to be superseded by another plan; neither is it probable that any great change will take place in hospital construction. Therefore the drawback connected with large hospitals mentioned above is likely to remain. It is, however, possible to greatly mitigate the evil by placing suitable huts in the gardens and yards of such hospitals as have the necessary spare ground. Already the continental hospitals have set us an example in this matter. For instance, ever since 1864 tents have been placed in the gardens of Bethanien and La Charité hospitals, Berlin; also at the hospital of St. Andrew's, Genoa, and at the Kiel hospital, tents are used for surgical cases; at the Cologne City Hospital a tent in the garden for eighteen beds is made use of; at St. Petersburg three barrack hospitals have been in use through the very severe winters with good results; and at the Vienna hospital, hut hospitals have been introduced. F. H. Brown, M.D., of Boston, says: "As adjuncts at least to the hospitals, we should look at the

huts in our hospital yards, in the warmer seasons, as the most suitable places in which to treat the gravest wounds and many of the severer forms of disease." Tents are only bearable when the weather permits their sides to be raised; huts are therefore greatly to be preferred, and in England patients could be treated in them throughout the year.

Respecting patients doing well in huts, more especially in wooden ones, we have abundant proof in surgical war reports, and there can be no doubt that patients who have undergone severe operations, or those suffering from diseases requiring fresh air treatment, will have a much better chance of recovery in them than those who are treated in the ordinary ward of a large hospital,—so, at least, high authorities speak when showing the superior advantages which hospital huts offer for the treatment of medical and surgical cases.

One hundred years ago Dr. Ferrier, in his account of Fever Wards, says: "I believe there is not a town in the kingdom containing four thousand inhabitants which would not be greatly benefited by similar establishments"—viz., fever wards. The same may be said at the present day, but a hut hospital is all that is required for small populations.

At ports, more especially when the approach of cholera is to be feared, a well-planned hut hospital is most desirable.

In times of epidemics, when hospital accommodation is strained to the utmost and requires immediate increase, huts would do far better service than either tents or floating hospitals; and, indeed, at all times, in a climate of incessant fluctuation, with its ceaseless

perils to health, and generating ailments—particularly phthisis (whose heavy death rate is ever pleading for spots protected against climatic vicissitude)—such appliances as these hospitals in miniature, of easy and cheap locomotion, might be kept in store ready for any emergency.

These auxiliaries, well planned and constructed, easily removed and disinfected, with many-sided advantages in dealing with the civil patient, potent in preventing the spread of infectious disease where the poorer classes predominate, and forming not only adjuncts to large hospitals but complete hospitals in themselves, would prove simply invaluable. Their value, indeed, might come into comparison with another institution—the Cottage—and perhaps raise the question of supplanting it.

Hut hospitals of many varieties have been designed, but chiefly for military purposes. At the Antwerp International Exhibition of 1885 sixty varieties of models and drawings of hut hospitals were exhibited, the awards being given to those which were most suitable for the field of battle—that is, to those that could be most easily erected, dismantled, transported, and of the least weight and expense; but for civil purposes these matters are not of primary importance. The civil exigencies are, however, sufficiently exacting. Whether the demand be for warmth in winter or coolness in summer in response to varying seasons, or for stability, or for sanitation, or for security against the risks of fire, all such and kindred items call for the most careful and adequate consideration. In the construction of a hut hospital one of the first difficulties to overcome is the

choice of suitable materials. Various kinds of cloths, Willesden paper, iron, and wood have been used for the purpose, and all highly spoken of. Willesden paper makes a good roofing material, but is not fireproof. If wood enters much into the construction, it should be rendered fireproof by one of the many known methods. The floor should always be of wood and raised some distance from the ground; and double sides and windows would do much to maintain the temperature within a fixed range; moreover, they can also be made use of in forming a ventilating scheme.

There is much to be said in favour of iron or zinc for an external covering, with an inner lining of some other material; the great drawback of the excessive fluctuations of temperature within an iron building might, perhaps, be overcome, if only sufficient ingenuity were exercised, and money did not stand in the way of experiment.

The following is a brief sketch of a movable hut hospital, in which the designer has kept in view the necessity of the patients breathing a pure atmosphere at all times and seasons without discomfort or injurious draughts. The whole building can be disinfected whenever required, a temperature of about 60° F. can be maintained in cold weather, and the building may be easily transported and erected. This hut hospital is dodecagon in plan and raised two feet from the ground. The sides are double, and, although permeable by the air, can be kept clean and free from damp. This is accomplished by filling up the space (two to four inches) left between the outer casing and inner lining with charcoal or dry earth, a method being devised for its

easy introduction and removal as often as it may be thought fit, and for the free passage of air through it. By this means it is hoped that the aërial dissemination of particles of dry organic matter, which no doubt often contain contagia, will, to a great extent, be prevented, and will also be especially beneficial in the case of patients suffering from infectious diseases not only as accelerating their recovery but arresting the spread of infection. The total destruction of the contagia contained in the charcoal or earth is made sure by exposing it to dry heat after its removal from the sides of the hut. The windows are double and so constructed as, when open, to shield the patients in bed from hurtful draughts; both windows and doors are placed between each pair of beds. The floor is an ordinary well-laid plank one, and the whole area is underlaid with a damp-proof course. The artificial heat is supplied by a combination of four open fireplaces and a warm-air apparatus placed in the centre of the hut; the smoke flues descend, then pass under the floor and up the inner sides of the walls before escaping through the roof: by this contrivance most of the heat given off from the fires is utilised and the floor is kept warm and dry. Fresh air streams gently downwards into the bed-spaces through a perforated ceiling placed over each bed, and so pure air fills the space where it is most required instead of a stagnant foul atmosphere, as often is the case when ventilating inlets and outlets are only supplied between the beds. When the season permits, the patients, although in bed and under shelter of the hut, may practically be in the outer air without being put to any discomfort. In cold weather fresh warmed air is supplied.

The chief dimensions of this movable hut hospital which is intended for eight beds (but under exceptional circumstances the number may be raised to 12) are as follows :—

Diameter of the imaginary circle described through the angles of the dodecagon	} 31 feet
Height from the floor to springing of the roof..	6.25 feet
Length of Internal Wall.....	96 feet
Area of floor space.....	714 superficial feet
Total cubical space.....	9,170 cubic feet
Glazed surface.....	100 superficial feet
Ditto, ratio with regard to body of building	} .. 1 superficial to 45 cubic feet
Ditto, ratio to wall surface.....	1 to 6
Total inlet and outlet ventilating spaces, not including windows, doors, or roof openings at apex	} 2,640 square inches
Ratio of chimney section to cubic space in building	} about 1 square inch to 100 cubic feet
No portion of the hut when dismantled exceeds 8 feet in length. Its total weight is about 6 tons.	

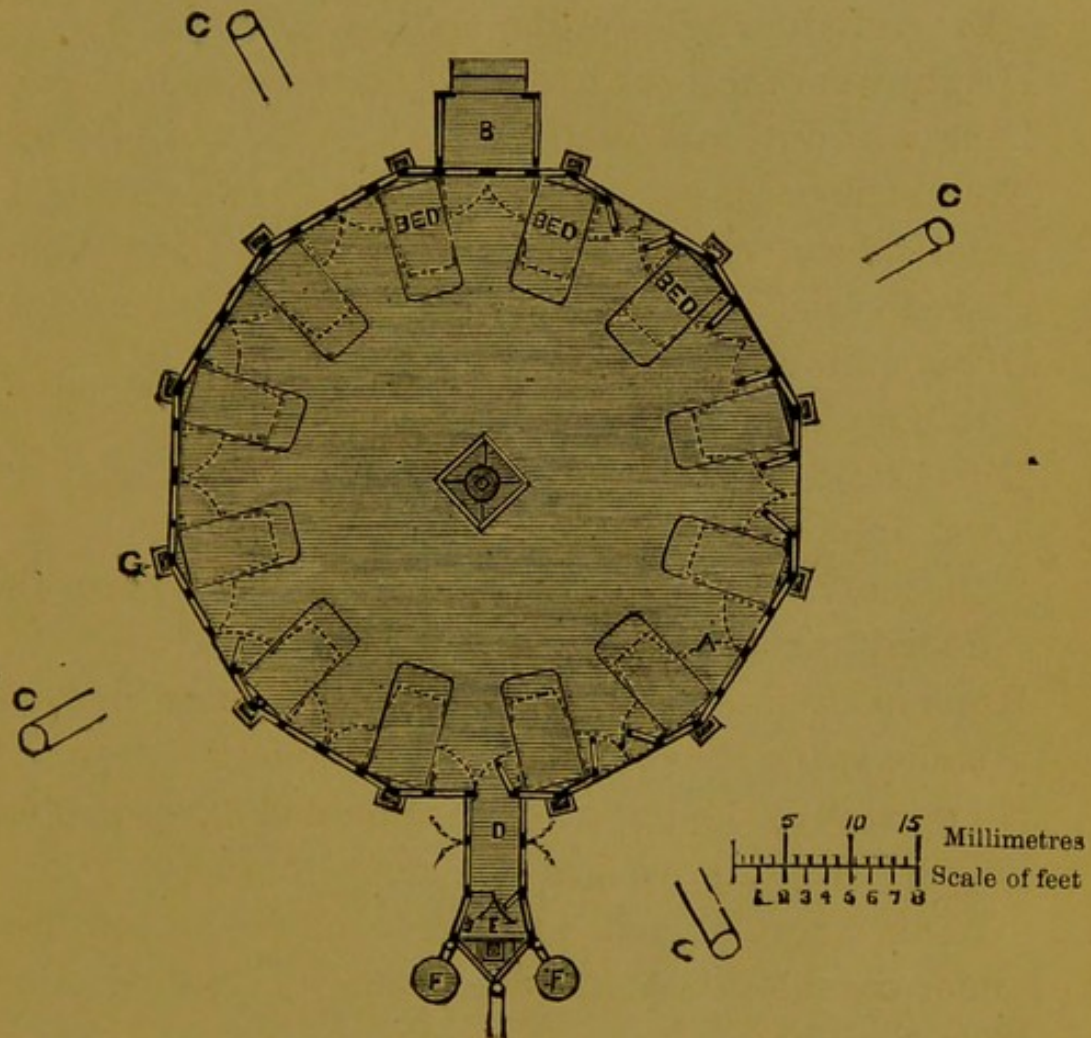
This short sketch will give some idea of the hut under consideration, although only its chief peculiarities have been pointed out.

At first sight the construction of a hut hospital suitable for either civil or military purposes does not seem a very difficult matter, but it is a subject that requires and is worthy of much study.

The more hut hospitals come into use the more will hospital authorities become convinced of their utility. At the present time their true value, both in the treatment and prevention of disease, is not recognised.

Plan of the Hut Hospital Ward,

Designed by the Author, & exhibited at the Antwerp International Exhibition, 1885.



In the centre of the Ward is seen the section of the Fire-places and Warming Apparatus.

The combined Windows and Doors are shown between each pair of Beds.

The dotted line **A** marks the position of the perforated ceiling above the Beds.

B—Main Entrance.

C—External opening of Air Ducts supplying the Warm-air Apparatus.

D—Lobby.

E—Cabinet d'aisance.

F—Water Tanks.

G—Uprights, or Standards.

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