

APPENDIX No. 11

VARIOUS TYPES OF HUTS AND TENTS IN COMMON USE¹

(i) THE ACCOMMODATION OF TROOPS

The following study of housing as a problem in hygiene is from an article² by Colonel W. W. O. Beveridge—sometime Professor of Hygiene, Royal Army Medical College; and, during the war, A.D.M.S. Sanitary, G.H.Q., B.E.F.:—

“Overcrowding has always been recognized as a prominent factor in the spread of disease both in civil and military life. In England as long ago as 1861 the Royal Commission for Improving the Sanitary Condition of Barracks commented as follows.

“‘Before the soldier can be assured of having the amount of space required for health, there must be a distinct recognition that the amount given by regulation (*i.e.* 600 cubic feet) is on no account to be tampered with. No increase of regimental strength, no want of store rooms, libraries, or reading rooms, should for an instant be permitted to interfere with it. . . .’

“During the period prior to the war accommodation in barracks and hutments in Great Britain was provided on the scale of 60 square feet and 600 cubic feet per man. On the outbreak of the present war the great influx of recruits necessitated a somewhat less generous provision, and having regard to military exigencies 40 square feet or 400 cubic feet was fixed as the minimum accommodation which could safely be permitted in quarters. This has since come to be regarded as a war time standard which every effort should be made to attain.

“All epidemiological experience points to the very marked effect which overcrowding exerts upon the spread of infectious diseases, especially those affecting the respiratory tract. It is a matter of common knowledge that when diphtheria occurs among men who are crowded together, ‘carriers’ of Klebs-Loeffler bacilli are usually numerous, and

¹ Apart even from “enemy action” the problem of the housing or sheltering of two millions of British soldiers in the attrition warfare of the Western Front was a stupendous business. Thus, at the British Expeditionary Base in France alone—*ex pede Herculem*—more than 78 miles of hutment was constructed by the Royal Engineers

² Entitled “Considerations in the Prevention of Respiratory Affections” published in the *Research Society Reports* by the American Red Cross Society in France (*Vol. II, No. 3, Oct., 1918*).

when these men are spread out in well ventilated quarters the 'carrier' condition rapidly disappears.

"The evil effects of crowding together in ill-ventilated wards, patients suffering from measles, are well known; the severity of the disease increases, and deaths from pneumonia as a complication may reach a high figure. Should such a state of affairs occur, experience has shown that it can be immediately remedied by the simple procedure of providing sufficient space and adequate ventilation. . . .

"By the simple expedient of allowing a space of 2 1/2 feet between each bed and by improving the ventilation of the quarters, the carrier rate, [in C.S.F.] in one instance, fell from 28 to 2 per cent. in 9 weeks, from 28 to 7 per cent. in 6 weeks in another, from 35.8 per cent. to 4.5 per cent in 6 weeks in a third, and from 28 per cent. to 4.5 per cent. in 5 weeks in a fourth.

"A large number of similar experiments were carried out, all of which support the view that the distance between beds is of paramount importance and that quite a moderate degree of 'spacing out' of beds combined with simple methods for improving ventilation is highly effective in reducing carrier rates. . . . The important elements in 'overcrowding,' so far as the spread of infectious diseases affecting the respiratory passages is concerned, are, therefore, proximity of heads and defective ventilation. Ventilation may be improved within the limits short of creating a draught, but satisfactory results can only be expected when close proximity of heads is also prevented.

"Proximity of heads and degree of ventilation are, therefore, the criteria by which the adequacy of accommodation should be judged. . . .

"Hutting accommodation for the British Army on the Lines of Communication in France is provided on a basis of 4 feet of wall space per man, unless the huts are more than 20 feet wide, when 40 square feet of floor space per man is allowed. This includes accommodation for Labor Companies, both white and colored, and for prisoners of war and their escorts. Vigilance is exercised in preventing more men than the authorized number from being accommodated in any hut, particularly in the case of colored laborers who are specially susceptible to respiratory diseases.

"In ordinary hospitals 60 square feet of floor space with six feet of wall space per patient is provided, but during periods of pressure this may have to be reduced to five feet of wall space. In hospitals for infectious disease 100 square feet of floor space is allowed.

"Several types of huts for the accommodation of troops have been erected, the majority of which vary from 16 to 20 feet in width.

"The Adrian Hut is constructed in sections of 2 metres length which can be bolted together. Its extreme width at floor level is 27 feet 4 1/2 inches. A hut 30 metres long can accommodate 69 men giving each approximately 40 square feet of floor space, if the precautions referred to below are observed. Thirty beds could be placed down each side, and owing to the great width of the hut 9 can be arranged end to end down the centre. In order to make the best use of the available floor space it would be necessary for alternate men in the beds along the wall to sleep with their heads projecting towards the centre of the room. This arrangement could be still further improved by drawing alternate beds one foot away from the wall [*see page 557*]. To ensure this arrangement being adhered to, it would be necessary to fix the beds to

the floor and to make the head end of each bed slightly higher than the foot so that men would be constrained to sleep with their heads at the proper ends. The difficulties of carrying out these refinements in actual practice are obvious. It has also been suggested that risk of spread of infection might be diminished by the erection of small partitions or screens between each bed.

"In army areas variations in the patterns of hut have lately been restricted for the sake of simplicity and convenience; the following are typical examples of huts utilized in army areas as shelter for troops.

Adrian Huts	30 metres	Men or Institutes
Standard Hut	60' x 16'	Men or Institutes
Nissen Bow	26' 10" x 15' 8"	Men
Nissen Steel Tent (Circular)	Diameter 14' 6 1/2"	Men

". . . Ordinary circular bell tents, diameter 12' 6", usually accommodate not more than 12 men, but on occasion, 14 men may be placed in a tent. The wall space, floor space, and cubic space are thus below the standard prescribed for hutted accommodation. In warm weather when the tent flaps are kept open, this is partly compensated for by free ventilation, but during wet and cold weather when the tent is closed the conditions both in regard to proximity of heads and ventilation are such as would favour the spread of disease affecting the respiratory passages. Owing to the men being grouped in separate tents, the danger of spread of disease is limited and the risk of an extensive outbreak is not so great as if the same degree of overcrowding occurred in a large hut or barrack room

"It is obvious from what has already been said that overcrowding is a relative matter and no definite line of demarcation can be drawn between ample space and overcrowding; the two merge gradually into one another. For practical purposes, however, a compromise between military necessity and the ideal has to be made. The minimum standard of accommodation already referred to represents the practical compromise which has been effected; less accommodation than this increased enormously the chances of spread of infectious disease affecting the respiratory tract. ."

(ii) TENTS AND HUTS FOR HOSPITAL PURPOSES

At least 25 per cent. of the total force engaged (it was laid down in engineering manuals) will require hospital accommodation. Important as is this matter³ it must yet be dismissed very briefly

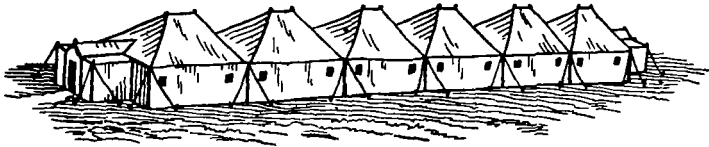
A great variety of tents and huts were in use, tents ranging from the "Tortoise tent" of the field ambulance (20 feet by 14 feet) through various types and sizes up to the immense "Bessoneau" hangar (45 metres by 21 metres⁴) used for the French H.O.E. The accommodation of rectangular tents could be increased almost indefinitely by the procedure of "brigading" whereby two or more tents were laced together, end to end or side to side.⁵

³ The *Brit Off Medical History, Hygiene Vol I* devotes 66 pages of letterpress, fully illustrated, to this subject

⁴ i.e. 147 ft 7 in by 68 ft 11 in

⁵ This is taken from an admirable account of "brigading" compiled for the Q.M. No. 2 A.C.C.S. (Capt J.H. Pollard) by Sgt. T. Fitzpatrick and included in the war diary of the unit for Apr., 1918

The most exacting unit in the matter of housing was the C.C.S. by reason of the varied nature of its work and environment. In November, 1917, a definite scale of tents was laid down in *General Routine Orders*



The "Brigading" of Marquees—a complete brigade of six tents joined end on.

for a C.C.S. This allotted 80 "Hospital" marquees which should accommodate 200 patients in beds and 800 on stretchers. The capacity of the tents and huts in common use was

- Small marquee—8 beds or 12 stretchers;
- Large marquee—14 beds or 20 stretchers;
- Nissen ward hut—24 beds or 28 stretchers;
- Adrian hut—40 beds or 60 stretchers.

In addition to these, various small huts were in use, the best known being the "Armstrong"—of two types, 24 feet by 15 feet and 12 feet by 9 feet 3 inches. Just before the Armistice the French "Bessoneau" tent and "hangar" were being introduced into the British Army in place of the "Hospital marquee large."

In addition to wards, operating rooms, reception and dressing rooms, accommodation had to be provided for officers and other ranks of the R.A.M.C., for the nursing sisters, and for convalescents, or "B" class men attached for duty. Many accessory constructions, usually of an improvised nature, were also necessary, such as lavatories, baths, latrines, blanket stores, stretcher dumps, sterilizing room, dentists' hut, X-ray huts, shed for disinfectant, lamp and oil store, and so forth.

"*Dugouts.*" In one very important line of action British Army procedure differed greatly, even fundamentally, from the German. This was in the provision of underground shelter. Whatever arguments might be (and were) adduced to show that the sheltering of troops in dugouts tended to reduce their "offensive" spirit, the argument scarcely condones failure to provide shelter for the wounded while receiving treatment.