1 of *B. typhosus*. Of these, two presented the clinical picture of cholecystitis—one having gall-stones. The gall-bladder wall of the third case was the only part of the body found to be infected with the enteric organism. The fourth simulated acute appendicitis. All four cases presented profound toxic manifestations, an irregular temperature and abdominal pain. Examination of the abdomen revealed at most only slight rigidity, no rash, and no recognizable enlargement of the spleen.

2. A plea is made for thorough bacteriological examination of cases with vague abdominal symptoms which do not correspond closely to any mild digestive disturbance or acute abdominal condition.

3. In the interests of the community, enteric carriers should be "tracked down," and, when necessary, administrative action should be taken to minimize their danger to those around them, especially by prohibiting their employment in any business where food is handled.

In conclusion, I desire to thank Professor T. J. Mackie for guidance in the course of the investigation; Professor Murray Lyon, Dr. Goodall, and Messrs. Scot-Skirving, Struthers, and W. Q. Wood for the clinical details of the cases; and Professor Lorrain Smith and his staff for facilities for obtaining specimens and permission to publish details of the post-mortem findings.

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A REVERSIBLE BED FRAME FOR SPINAL AND OTHER SPECIAL CASES.

BY

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DURING the war one had frequent necessity for a bed which would give ready access to the back or buttocks without moving the patient. Especially did this need arise in cases of spinal injury, in which special daily attention to the skin was required in order to prevent or to treat bedsores. At first we were content with the Pearson's bed, in which the frame is high and the patient is supported on transverse canvas slips, any of which can be removed. But this device is very difficult and uncomfortable for nursing, because the nurse has practically to creep under the bed, and even then the back is seen with difficulty. We then had a tubular frame or cage made which was held inside a Pearson's bed frame and was made to turn over. This gave ready access to the back, and proved so useful that when the war was over a special bed was designed

which should embody these principles. This has been carried out, and for the expenses of the work I am most grateful to the Association of Surgeons for a grant which they made me for the purpose. The design which was first elaborated was, I think, too complicated, as it included

FIG. 1.

a device whereby the cage in which the patient lay could be tilted about a transverse axis, as well as rotated round a longitudinal one. In actual practice we found that the former movement was used so seldom that it was not worth while to have it provided for, as the same effect can be

FIG. 2.

attained by lifting the head end of the bed frame and supporting it by two chains placed under the transverse bar.

The model which I am here describing has now been in constant use for the past few years, and it has passed the critical test of those sisters and nurses of the Bristol

FIG. 3.

General Hospital who have been most enthusiastic in helping me to perfect its details.

The accompanying figures will, I think, serve to illustrate the construction and working of the bed. Fig. 1 shows the patient lying on his back, the head being raised on a pillow. The mattress is made in two longitudinal

halves separated from one another by a space of about 3 inches in their whole length. This gap allows the spine to rest on the split mattress without pressure upon the spinous processes of the vertebrae. In the middle of the bed the gap between the mattresses consists of a hole 8 inches in diameter, into which the special bedpan fits. This hole for the bedpan is suitably protected by rubber sheeting to prevent soiling the mattresses. The bedpan (A) is held by a lever which works in such a way that when pushed into place under the patient's buttocks the bedpan rises close under the hole in the mattress. When the pan has to be emptied the lever is pulled into position, shown in the illustration, and it drops so as to clear the bed frame. The case in which the patient lies is large enough to take a Thomas spinal frame or a hip abduction frame in a moderate degree of abduction. If this is used the lower mattresses would be discarded.

To the sides of the cage are hinged two flaps, on to which are strapped half-mattresses (B). Except when the patient is to be turned over these flaps lie as shown, flat against the sides of the bed cage. When the patient has to be turned over, the pillow is removed from under the head, and one pillow placed in front of and at the sides of his body, so as to pack him tightly in the cage. The flaps are then turned over so as to cover in the front of the patient, and are secured in this position by a catch and screw at the head, and another at the foot of the cage (C in Fig. 3). The front mattresses of the cage, when in position in front of the patient, have a 4-inch gap between them, which gives ample space for the face (D in Fig. 2).

The patient, being now snugly encased between the two sets of mattresses and the side pillows, can be turned over. This is done by releasing the catch (C) at both ends of the bed frame, and Fig. 2 shows the patient in the cage being turned over. When the cage has been reversed by being turned through a half-circle it is fixed in this position by the catch, and the back halves of the cage are open. In Fig. 3 one half (E) is seen being lifted up, and the other (F) has been dropped down by the side of the cage. The patient's back is now fully exposed for the purposes of dressing or attention to the skin of the buttocks.

The cases for which this device has proved to be of the greatest service have been: fractures of the spine, with or without paraplegia and paralysis of the bladder; tuberculous disease of the spine, especially cases in which a bone graft operation has been done; spinal cord tumour with paraplegia, or after a laminectomy; bad cases of fracture of the pelvis; special cases of fracture of both femora; and bad cases of burns involving the back.

The bed has been made for me by Messrs. Nesbitt-Evans and Co. of Wednesbury (Staffs), to whom I am greatly indebted for their trouble in carrying out my design.

THE RELATION OF ORTHODOX RHEUMATIC INFECTION TO MULTIPLE INFECTIVE ARTHRITIS.

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It is manifestly impossible from a statistical point of view to assess the relation, if any, between the acute and the more chronic forms of rheumatic disorder unless such terms as "acute rheumatism" and "chronic rheumatism" have a standard significance. As, however, the term "acute rheumatism" in the generally accepted sense means rheumatic fever, and the term "chronic rheumatism" is indiscriminately applied to many dissimilar affections of both muscle and joint, it is proposed in this paper to deal only with orthodox rheumatic infection and with multiple infective arthritis. By the former is meant frank rheumatic fever, and by the latter that type of subacute or chronic arthritis which is non-suppurative and is generally conceived to be due to infection of a non-specific character—in other words, which is not gonorrhoeal, pneumococcal, tuberculous, or syphilitic in nature. "Rheumatoid arthritis," as opposed to osteo-arthritis of

the hypertrophic type, and "atrophic arthritis" are other terms for the disorder in question. Any arthritis which can be classified as being due to, or associated with, disordered metabolism, such as climacteric arthritis, is thus excluded from the series under discussion.

The possible relation of orthodox rheumatic infection to multiple infective arthritis was investigated by the following methods.

1. The evidence afforded by the family history of 50 consecutive cases of multiple infective arthritis in regard to orthodox rheumatic infection.

In 16 instances rheumatic fever was known to have occurred in a parent, brother, or sister.

2. The incidence of a clear history of orthodox rheumatic infection in 300 consecutive cases of multiple infective arthritis. By a clear history is meant the patient's positive assertion that rheumatic fever had occurred earlier in life and was not immediately connected with the present disability. This evidence was frequently borne out by the individual's own private practitioner.

Rheumatic fever is believed to have occurred in 14 instances, without, however, the presence of discernible complications of a cardinal nature (for example, carditis or large subcutaneous nodules) at the time of examination. This series does not include 13 additional cases in which rheumatic fever was alleged by the medical practitioner in charge of the case to have immediately preceded the onset of infective arthritis.

3. The occurrence in the aforesaid 300 cases of cardinal signs of orthodox rheumatic infection—namely, cardiac lesions of the orthodox rheumatic type and large subcutaneous nodules of the same histology^{1,2} as those which occur in rheumatic fever of childhood. The millet seed granules³ described by me as occurring in subacute rheumatic infection of childhood and in multiple infective arthritis are not included in this category.

The findings of the cardinal signs of orthodox rheumatic infection in these 300 cases of infective arthritis can be tabulated as follows.

	No Rheumatic Fever.		Rheumatic Fever.	
	No Nodules.	No Nodules.	No Nodules.	Nodules.
Mitral stenosis	3	2	—	—
Mitral regurgitation	2	—	1	2
Aortic regurgitation (in young subjects with negative W.R.)	2	—	—	—
Nodules	No carditis ... 13		No carditis ... 1	

Conclusions from the Above Data.

1. The incidence of orthodox rheumatic infection in the immediate family history of 50 consecutive cases of multiple infective arthritis is 32 per cent. This is a very high percentage, and accords with the popular conception that "rheumatism" has a familial or hereditary basis.

2. A low estimate of orthodox rheumatic infection in 300 consecutive cases of multiple infective arthritis is nearly 5 per cent. The attack rate of orthodox rheumatic infection among the under 15 population in Norway⁴ is given as 0.8 per 1,000, and the highest figures published are from the Royal Naval School at Greenwich⁴—namely, 6 per 1,000. The attack rate was 2 per 1,000 in the 16-24 age period of the Ministry of Health's inquiry⁴ into "rheumatism" in insured adults of both sexes.

3. The cardinal signs of orthodox rheumatic infection—namely, carditis and/or subcutaneous nodules—were present in 300 consecutive cases of infective arthritis in the following percentages:

	Per cent.
Cardiac lesions only without a history of rheumatic fever	2.33
Subcutaneous lesions only without a history of rheumatic fever	4.33
Cardiac lesions in the whole series	4.00
Subcutaneous lesions in the whole series	6.00

These cardiac figures are much higher than those given for organic cardiac disease after routine examination of school children⁴ in England and Wales, 0.7 per cent.; in Scotland, 0.52 per cent.; and in New York,⁵ 1 per cent.

In regard to subcutaneous nodules, Carey Coombs⁶ has stated that of the principal phenomena of orthodox rheumatic infection—namely, carditis, polyarthritis, the