Belsen: Medical Aspects of a World War II Concentration Camp

PAPER 1

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O Lord of Hosts, be with us yet
Lest we forget—lest we forget!
Rudyard Kipling.

PROLOGUE

Personnel and relatives of personnel of the Defence Forces Medical Services may and often have in their possession, (or may find themselves in a favourable opportune situation to acquire) items which are of particular professional and/or historical interest especially to our Corps, and it behoves us who are at present carrying the torch to encourage the acquisition of such interesting and valuable items for the information and education, professional and liberal, of fellow members of the Forces Medical Services, as well as to hand these over to our successors in the Army Medical Service.

Such were the events which occurred a few months ago when documents, and a captured German microscope, belonging to a wartime RAMC officer (Major Allen Percival Prior) were being disposed of elsewhere by his widow Mrs Mary Prior, of 58 Church Street, Barford, Warwick.

My son Dr Emanuel J Vella, a consultant pathologist in the West Midlands happened by good fortune to be on the spot and advised the Army Medical Directorate in time for the DGAMS to write and persuade the lady and her advisers to let the Army Medical Service have the first say in the disposal of these items.

The lady and her advisers agreed, and the Director of Army Pathology (Brig N England) travelled up to Warwick and brought back the desired items. In due course the documents were passed on to Maj Gen J Crowdy, the Editor, who having perused the files and found them of much interest, entrusted me with the task of preparing extracts from the documents for publication in our Journal and so make our readers aware of this acquisition.

The study of Maj Prior's wartime papers led to the hunting and tracking of other germane papers; what follows are extracts from such material suitably selected by me, by now deeply committed and totally absorbed in the uncovering and unfolding of a terrible and tragical tectonic aberration.

The tale I retell is piteous and heartrending and will assuredly grip, captivate and enthrall you, the reader.

The Belsen Scenario

On the 12th April 1945 the Chief of Staff of the First German Parachute Army approached the Brigadier, General Staff of the British Eighth Corps. He said that a terrible situation had arisen at Belsen and that typhus was raging there. He asked us to take the place over.

On the 13th April 1945 the terms of the special truce were drawn up; at that time the battle was going on all around the Belsen area. Under these terms the British agreed to go in and take over the camp; a neutral area was defined around Belsen.

It is believed that Brigadier Glyn Hughes, Deputy Director of Medical Services, Second Army, was the first to arrive. The first British unit in was an anti-tank battery of the 63 Anti-Tank Regiment on the 15th April 1945. Lt Col Johnston with 32 Casualty Clearing Station went in on the 17th April 1945.

The tasks which faced the first comers must have appeared insurmountable; nevertheless they were tackled with amazing success, when one considers the resources available.

By the 19th May the Concentration Camp was cleared of the last person. All the inmates moved to the four hospitals and 3 transit camps in the Barracks area.

A total of 78900 were evacuated from that camp; the British supervised the burial, by the SS and German POWs, of some 23000 of which approxi-
The Concentration Camp was burnt down on the 21 May 1945, at 6 p.m., ending the first chapter in the history of Belsen since the British took over.

The final chapter will be the nursing back to health in the hospitals of the thousands who are sick in mind and body.

From: Notes on Belsen Camp by H L W Bird, Commander 102 Control Section, Second Army, Belsen Camp, 18 May 1945.

Concentration Camps

Concentration camps were not wholly a World War II phenomenon. In Germany they were established with the advent of Hitler to power; their purpose was the incarceration of all those whose continued freedom seemed to threaten the security of the NAZI regime; they were in fact prisons of a particularly brutal kind.

They operated behind a wall of secrecy and the terror of the unknown, and the stories which filtered through served as a powerful deterrent and discouragement to the opponents of the new power. The war added greatly to the number of these camps and radically changed their purpose. On one hand there arose the plan to exterminate the Jews, Slavs and other so-called 'inferior' peoples, and on the other the plan to take advantage of all the slave labour which the occupied territories could afford.

The position of Belsen was unorthodox and it fell into neither of these classes. Originally it had contained a comparatively small number of 'exchange Jews', that is to say Jews whom it had been decided to repatriate, or to allow to leave Germany, for reasons of State or for profit. At that period it had been comparatively well managed. Towards the end of 1944 it was designated as a Sick Camp, and it was only then and in 1945 that the number increased and that appalling conditions developed. The
sudden influx of prisoners was mainly the result of the evacuation of other camps in the east which had been overrun by the Russians. The horrible conditions at Belsen were caused by criminal and inexcusable neglect coupled with an administrative breakdown.


SECTION I
Observations by embodied and career RAMC Officers

My remarks will concern Belsen (situated about 15 miles north of Celle, between the villages of Bergen and Winsen) as it was before and after we liberated it, the conditions we found there and the difficulties we had to overcome.

By means of hostages the Germans intimated to us that there was within their lines a concentration camp containing 1500 cases of typhus but at no time did they give any indication of the appalling conditions we were to find there when we captured its area. As events proved there must have been between 10000 and 20000 cases there.

In all they stated that there were about 55000 prisoners in two camps in the area; in the smaller situated in the local barracks area were 15000 men who had not been there long — a week or ten days. There was no typhus, and not a great deal of disease amongst them but varying degrees of malnutrition. In the actual concentration camp were 40000 men and women and a considerable amount of disease of all kinds including typhus.

At that time we were still fighting hard. The demands on our medical Services were very great with fighting commitment alone, but in addition there were vast numbers of displaced persons streaming back, and also large collections of Germans wounded in the many hospitals both military and civil on the line of our advance: both heavy commitments.

The medical units available were therefore very few and all that could be spared initially was one Casualty Clearing Station, one Light Field Ambulance and two Field Hygiene Sections.

After a quick survey of the whole camp an appreciation was made that 25000 required immediate hospitalisation and of this number 10000 would probably die despite all efforts. These figures proved to be very near the mark although the number of deaths after liberation was higher, approximately 13000.

In the camp there was no sign of hygiene at all; huts which should have contained at the most 80 to 100 prisoners, in some cases had as many as 1000. Some huts had a lavatory but this had ceased to function and the authorities had made no provision outside, so that conditions in the grounds and in the huts themselves were appalling especially when it is realised that starvation, diarrhoea and dysentery were rife.

Apart from the frightful conditions in the compound and huts there were many other horrors — the enormous piles of dead lying everywhere, a crematorium, a gallows in the centre of the camp, signs of mass burial, an enormous grave open and half filled.

That is a broad picture of Belsen. The magnitude of the task was not really apparent until we got into the huts and we were faced with the appalling stench and sight of countless numbers of miserable skeletons herded together on the floor or in bunks, often four to a bed and the living sharing with the dead. There were few blankets and many were without clothing at all.

That first night the priorities were food, water and more troops. There had been no food or water issued for 7-10 days. The task of cleaning the area seemed at first insuperable, and the first essential was supervision by more troops, particularly directed to administration.

What were we to do straightaway? It was decided to give the best chance of survival to the greatest number, and therefore to move out at once into the Barrack area the supposedly fit and well, thereby making more room in the huts and supervision of feeding easier.

For many reasons it was not possible to implement these ideals in full, which included the careful selection of the next cases to be moved in order of priority, and it eventually came to a question of evacuating hut by hut.

The main difficulty of course was equipment for the Barrack area and it was obvious that this could not come from British Army sources in the number required. Eventually 14000 beds were equipped from every conceivable source by combing out a very wide area of country.

The other cry, and the most important, was for more help. We made use of what German doctors and nurses were available from those who had been made prisoners and asked at once for the help of the Red Cross, UNRRA, and any other available source.

The arrival of 97 medical students from the London Teaching Hospitals proved the greatest help and with their advent the death rate, which in the earliest days had been 500 per day, began to drop appreciably. With their knowledge and enthusiasm we were able to exercise much better supervision in each hut; they worked splendidly and I cannot speak highly enough of their efforts under the guidance of Dr Meiklejohn.
Dante's Inferno at Belsen: Some 10,000 dead were lying in the camp when we took over, and thousands more died before it could be cleared. Photos: Major Prior

Six Red Cross relief teams did wonderful work, and as time progressed, extra help was forthcoming from other sources, but the main brunt had fallen on Army Medical Units of the RAMC throughout the early days. The first medical unit commenced work on the 17th April; the first admissions to hospital on 21st April; the whole area cleansed by the 18th May, and during that time a hospital area of 14000 beds equipped and fitted.

I would like at this stage to pay a tribute to the work of Lt Col J A D Johnston and Lt Col F M Lipscombe, who were in charge of the administrative and medical side. The value of their work cannot be estimated.

From: German Concentration Camps — Early measures at Belsen. Observations by Brigadier H Glyn Hughes, DDMS 2nd Army at the Inter-Allied Conference June 4, 1945.
SITREP ON BELSEN CAMP

Camp 1 — Consists of huts housing 22000 females and 18000 males.

Camp 2 — Consists of brick buildings: 27000 males. All European nationalities are to be found but chiefly Russians, Czechs, Belgians, French and Italians.

Conditions prevailing

It is impossible to give an adequate description of the camp when entered on April 17th 1945. Camp 1 was full of emaciated and apathetic scarecrows — without beds or blankets and some completely naked. The females are worse than the males and most have only filthy rags. The dead are lying all over the camp and in piles outside those blocks, mis-called hospitals, housing the worst of the sick. There are approximately 3000 corpses in varying stages of decomposition. There is no sanitation but there are pits, some with birch rails. From apathy or weakness most defaecate in the huts or anywhere. No running water, no electricity, and all water brought by water trucks. Death rate is not known. Camp 2 is better, but there are 600 housed in buildings of 150 capacity. Death rate 10 per day. These internees are better clad and less emaciated, and attempts are made to bury the dead.

Diseases prevalent:

Camp 1 — Riddled with typhus and TB. Gastro-enteritis common. No cholera or dysentery diagnosed. Erysipelas and scurvy are prevalent.

Camp 2 — Enteric, TB and erysipelas. No typhus.

Rates of sickness: Seriously ill requiring hospitalisation but excluding starvation cases and those who will inevitably die:—

Camp 1 — Males 900, Females 2600.
Camp 2 — Males 500.
Total — 4000.

Medical Personnel: Internees fit to work:

Camp 1 — Doctors 42, Nurses 33.
Camp 2 — Doctors 6, Nurses 50.

Medical Stores: Negligible.

Urgent measures to be taken

(a) Bury the dead.
(b) Evacuate patients in Camp 1 to suitable clean buildings in Camp 2, with plans for reception, delousing and cleaning.
(c) Evacuate fit from Camp 1 to Camp 2.
(d) DDT all inmates.
(e) Arrange suitable feeding for patients. Death rate has increased since abundant food became available.
(f) Pile and burn masses of rubbish, rags and human excreta which litter the camp.

Work has started on all these projects, and in addition a hospital area in Camp 2 has been ear-marked, and is being evacuated and cleaned prior to the reception of seriously ill patients from Camp 1. This is to be for 7000 patients, and the following are urgent minimal requirements: blankets 14000, stretchers 5000; palliasses 7000, bedpans and equipment 700, urinals 700, cooking utensils for 7000.

From: An appreciation by Lt Col J A D Johnston OC 32nd (Brit) CCS, Senior MO of the Camp, 18 April 1945.

Medical Aspects

Systematic records could not be made but the relative prevalence of diseases among those taken into hospital was roughly estimated from clinical examination of a cross-section of an unselected batch of admissions checked by subsequent comparison with other batches and bacteriological and radiological examination when these became available. The prevalent marked conditions were deficiency disease, typhus and pulmonary tuberculosis. Diarrhoea was almost universal.

The outstanding deficiency was plain lack of food and water. These cases of starvation were divided by a broad but not clear-cut distinction into two groups:

1. The “dry” cases were characterised by extreme emaciation, with lowering of all bodily and mental processes, resulting in prostration, apathy, grossly impaired digestive functions, depressed peripheral circulation. Dehydration was a prominent feature. Slight oedema of the feet was often present but massive oedema was absent.

2. The “wet” cases had gross hunger oedema in addition to other symptoms. About 6% had hunger oedema on admission but many of these originally classified as dry developed it late.

Transient pyrexia without obvious infective cause occurred in both groups. Diarrhoea was very common and often aggravated dehydration. A small number of observations revealed low plasma protein, reduced volume and over-concentration of blood. Anaemia was often present and sometimes severe: it seemed to be more pronounced in the “wet” than the “dry” cases because among the latter it was possibly masked by haemoconcentration.

Cancrum oris was noted in about 0.5% of female admissions: it was not seen in males. It originated in ulcerative gingivitis around stagnation foci associated with dental bridge-work or crowned teeth, and Vincent’s organisms were constantly present.

The adverse effect of heat on cases of starvation was remarkable. The prevailing cool weather was
E E Vella

Noma: Cancrum Oris was noted in about 0.5% of female admissions, it was not seen in males. It originated in ulcerative gingivitis around stagnant foci associated with dental bridge-work or crowned teeth. Vincent's organisms were constantly present. Photo: Major Prior

interrupted by a few days when the temperature reached about 95°F in the huts. During this hot spell patients who had improved to the extent of taking solid food and getting about suddenly collapsed.

Clear cut specific-deficiency syndromes were strikingly absent. Evidence of possible partial deficiencies was as follows:

Vitamin A. No xerophthalmia was seen: a harsh dry skin with follicular keratosis was often encountered but the effects of dehydration, exposure and scratching made its aetiology doubtful.

Thiamine. A few cases of myocardial insufficiency with warm pink oedema suggested beri-beri heart but they failed to improve on 100 mgm thiamine a day. Peripheral neuritis which could not be otherwise explained was not observed.

Riboflavin and nicotinic acid. Varying degrees and combination of raw red painful tongue, often with marginal ulcers, 'cobblestone' tongue and angular stomatitis were met with, but no time cheilosis or genital signs. Diarrhoea was almost universal and some patients had suggestive pigmentation but no example of classical pellagra was seen and cases treated with 300 mgm nicotinic acid a day did not improve significantly more quickly than those who received the standard daily issue of 3 compound vitamin tablets (thiamine 1 mgm; riboflavin 1 mgm; nicotinamide 10 mgm and ascorbic acid 2.5 mgm) with their diet.

Ascorbic Acid and Vitamin D. No case of scurvy or of clinical rickets came to notice.

Infective Diseases

Typhus was the major illness in about 25% of the early admissions, and many other patients who were admitted during the incubation period developed it later. It presented no unusual clinical features. Measures for the control of the epidemic were under the direction of a representative of the United States Typhus Control Commission. Operations for delousing the whole population were completed April 30 and quarantine was lifted on May 21.

The modification of the disease in fully-immunised persons was exemplified in ten RAMC personnel who contracted it while working in cleaning and delousing operations in the huts. In all the cases the fever lasted 6-8 days only, instead of the usual 14. In all of some 50 uninnoculated partially inoculated well nourished enemy subjects who contracted it while employed on similar duties the fever lasted 14 days. None of the RAMC died and some of the others did, but the difference in these small series was not statistically significant.

Pulmonary tuberculosis in an advanced stage was clinically obvious in about 6% of admissions. Subsequent radiological examination of a cross-section consisting of 331 miscellaneous patients taken in groups at random from various parts of the hospital and unselected except that they were not too ill to be screened showed 6.6% positive, 5.3% probably positive and 7.7% possibly positive. The care of these sufferers is a problem for the future. Autopsies showed active tuberculosis disease in the lungs of a very high proportion of cases of starvation.

Diarrhoea. Almost all internees had diarrhoea at some time or another. It was due to a variety of causes. About 8% of our series of cases of diarrhoea had clinical evidence of dysentery, and bacteriological examination of other series of cases of diarrhoea was positive in 8% and 15%, the prevailing organism being B. dysenteriae Flexner. No cases of amoebiasis was detected. The infection responded well to sulphaguanidine and sulphathiazole.
except when complicating severe starvation. The great majority of cases of diarrhoea appeared to be of nutritional or dietetic origin and most of them cleared up with careful dieting. Medicinal treatment seemed to be useless. Autopsies often showed extensive ulceration of the large bowel, in one case with perforation.

Other diseases. Sepsis was present in many forms: sores, especially on pressure points, abscesses, and neglected wounds. Infective dermatitis of the impetigo type was surprisingly rare. Severe scabies was found in about 6% of admissions.

Typhoid. No clinically definite case was discovered. Bacteriological examinations were made in 36 suspected cases. *Bac. typhosum* was isolated from the urine of one but the others were negative.

Relapsing fever was especially sought for. A few cases were seen in which the diagnosis was clinically probably but thorough blood examinations were persistently negative.

Diphtheria. A few cases were diagnosed clinically and four were confirmed bacteriologically. It was remarkable that a widespread epidemic did not develop.

Malaria and Cerebrospinal meningitis were not encountered.

Psychiatric Manifestations. Psychosis, excluding that due to infective toxic causes such as typhus and psychoneurosis were less than evidence in less than one in every community of the same size — possibly because only the more extrovert and robust psychological types had survived the ordeal of their captivity. The most conspicuous psychological abnormality was a degradation of moral standards characterised by increasing selfishness, and was more or less proportional to the degree of undernutrition. In the first stage consideration for others was limited to personal friends, then the circle contracted to child or parent, and finally only the instinct to survive remained. Emotional response became progressively lowered and consciousness of sex was lost. Eventually all self-respect disappeared and the only interest left was to obtain something which could be eaten, even human flesh.

From: *Medical Aspects of Belsen Concentration Camp*, by Lt Colonel Frederick Martin Lipscombe, FRCP, RAMC. Medical Adviser Belsen, April-June 1945.

As far as I have been able to discover the following were our RAMC medical units which took part in the Belsen humanitarian operation:

- 32 CCS (Lt Col J A D Johnston)
- 35 CCS
- 30 Field Hygiene Section (Major P J Fox)
- 76 Field Hygiene Section (Major F R Waldron)
- No 7 Mobile Bacteriological Laboratory
- 11 Light Field Ambulance (Lieut Col M W Gonin)
- 163 Field Ambulance (Lieut Col M EM Herford)
- 9 Br General Hospital (Colonel A R Oram)
- 29 Br General Hospital (1200 beds).

*Colonel E E Vella, Assistant Editor*

SECTION II

**Observations by National Emergency (1939-1945)**

**RAMC Officers**

The liberation of Belsen Concentration Camp presented vast problems of administration and supply; the removal of the sick to the hospital area maintained and enhanced these problems and added those of mass medicine. The first objective was to get the patients fed and kept alive; the difficulties of diagnosis being tackled next. RAMC Officers were presented with some seven hundred patients each. These were of mixed nationalities and tongues and interpreting required a special organisation.

The patients were of varying grades of severity of illness, and death was common. In order to afford some assistance to the clinical side, it was decided to sample as many of the population as was reasonably possible, attacking in groups the presenting difficulties.

The concentration camp was known as Camp 1. In Camp 2, a former German military training school, the hospital area was prepared. At first some 7000 beds were equipped, but this figure was later to be considerably expanded.

Diarrhoea was rife in Camp 1. Coughs with copious sputum, fevers of various sorts—these were the most urgent problems. In addition, starvation with or without oedema was the rule. Adequate conditions for a fair dysentery epidemic were present. Malaria and spirochaetosis were possibilities that had to be borne in mind. Typhus was known to be present. Most other infectious diseases might have been encountered.

**Admission of patients**

The method of admission from Camp 1 to the Hospital area deserves mention. All the people were filthy beyond description and lousiness was very common, varying from a few nits, to heads packed with lice. A medical selected the patients from various huts.

These patients were stripped of all clothing which was subsequently burnt, wrapped in two blankets and transferred by ambulance to the Human Laundry. This, as an aspect of preventative medicine
The Human Laundry: The laundry consisted of a stable containing 20 tables which was staffed by 40 German nurses and 20 German orderlies. A section of a mobile bath unit provided constant hot water. Patients were brought in at either end of the building and washed on tables, dried, covered with DDT powder and then transferred to hospital. Average number treated daily was 650. Photo: Imperial War Museum

was under the direct control of one of us (E.M.G.). The laundry consisted of a stable containing twenty tables which were staffed by forty German nurses and twenty German orderlies. A section of a mobile bath unit provided constant hot water. Patients were brought in at either end of the building, washed on the tables, dried and thoroughly covered with DDT powder. The cutting of hair was restricted to those whose heads were solid with lice. They were then placed on clean blankets and stretchers and transferred to hospital. In the course of twenty six days 11,390 patients were dealt with in this manner. The average day’s total was 650; the peak day was 970.

The selection, washing and delousing of fit persons in Camp 1 before being transferred to a new camp area, was under the medical direction of Captain W A Davis, MC, USA of the US Typhus Commission. He also kept an eye on all general preventative measures. We would like here to record our appreciation of Capt Davis and his work and for the stimulation, help and encouragement that were so readily offered.

After a few days it was decided to start laboratory investigations on some of the more urgent clinical problems. One of us (APP) was in charge of the selection of cases and the collection of specimens over the whole hospital area which eventually contained over 13,000 beds.

Selection of Cases

(a) Diarrhoea. The most urgent problem was the investigation of the diarrhoea that had been rife among the people in Camp 1. The question was to decide whether this was infective or part of the syndrome of starvation. Since owing to the language difficulties little or no cooperation could be obtained from the patients it was decided to collect the samples personally. For the sake of ease and quickness rectal swabbing was first undertaken.
Delousing of Internees: The selection, washing and delousing of fit persons in Camp 1 before transfer, was under the medical direction of Captain W A Davis, MC, US Army, of the US Typhus Commission. Photo: Imperial War Museum

The general picture of these diarrhoea cases was that of a wasted person, who had had frequent painful motions from anything from a few days up to about five weeks. Blood and mucus were usually absent. This absence was also noticed in the enormous number of stools lying on the ground in Camp 1. It also gave rise to the impression that the diarrhoea was not dysenteric. Further inspection of a large number of bed-pans in the wards reinforced this impression. As the results show (Table 1) the bacteriology confirmed this clinical impression.

Subsequently a number of fresh stools were examined for exudate. None showed a typical bacillary exudate. Only one showed an indefinite exudate and also contained Trichomonas hominis. From one solitary selected case of bacillary exudate a B dys Flexner 2 was isolated. During the investigation, apart from a few days, the weather was cold and damp. Judged by tropical standards the flies were extremely rare.

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Note: These figures tend to support the view that a true epidemic of typhus was present.
Personnel of 11 Field Ambulance transferring Typhus cases from the huts to the improvised hospital. Photo: Imperial War Museum

(b) Typhus. From the clinical side, this problem was clouded by the difficulties of continental terminology, and from the serological side by the fact, that many of the internees had already had typhus, whilst others were in the acute stages of the disease. Two technical difficulties were encountered in trying to collect samples. The first was the degree of collapse of the veins in people who were supreme examples of mere "skin and bone"! The second was their real and apparently justified terror of any intravenous manipulation.

The only antigens used were 'O' suspensions of Proteus. At first a full range of serum dilutions from 1:40 to 1:4000 was done but in order to conserve material it was later decided to make only two dilutions. These were 1:200 and 1:400 the former being considered the most likely diagnostic dilution.

(c) Pulmonary Tuberculosis. Single sputum specimens from 260 cases, selected by the physicians were examined. In 59 of these acid and alcohol fast bacilli were present.

(d) Typhoid. It was expected that enteric fever would be present. To check on this, a selection of thirty six possible cases was made. Clot cultures produced no enteric organisms. Only one case of B. typhosa infection was found and that was isolated from a specimen of urine.

(e) Starvation. By far the greater number of patients taken from Camp 1 into the hospital suffered from varying degrees of starvation. Cases of pure starvation were difficult to find owing to widespread intercurrent infections. Mass nutritional experiments were carried out by other workers who sent us material for investigation. Plasma proteins were estimated by the Phillips and Van Slyke Copper Sulphate method. In these cases the general finding was that the plasma protein ranged from 4.5 to 7 grams per cent, although lower readings were en
countered, the lowest being 3.5 grams per cent. Further investigations at a later date did not show any general rise in these figures.

(f) General. Routine laboratory work was also carried out for the whole hospital area. A total of 500 cases were investigated and 709 specimens received during the four weeks under review. Blood counts, of which 126 were done, showed an anaemia, usually of the order of 300000 red cells with 60% haemoglobin. No striking characteristics were noted in association with starvation cases. Diphtheria did not appear to be prominent and out of 28 throat swabs submitted for examination four were positive.

A number of women patients was seen with Bacillus Anthracis in an advanced stage. Swabs from some of them showed a great variety of organisms amongst which Vincent's organisms were almost constantly present.

(g) Post Mortem Examinations. Two types of cases were selected for post mortem examination.

1. Those dying from typhus showed the customary charges. There was very little to be seen in the general visual pathology and the only positive finding was a slightly pinkish haemorrhagic brain, more marked in the white matter. Specimens from these brains have been preserved for histological examination by other workers.

2. Those dying from starvation showed extreme wasting; most of them also had oedema of the ankles and feet. Very often there was a few ounces of clear fluid in the pericardial cavity. The heart was, in some cases, extremely small and weighed from 110-250 grams (normal male 350-400, female 300-350 grams). Evidence of active tuberculosis was found in nearly all these cases. This varied from a recent small activation of an old focus to well established miliary or chronic pulmonary tuberculosis. The stomach was generally of very small capacity although occasionally it was distended by gas. The positive findings in the intestinal tract were usually confined to the large intestine. Here the mucous membrane was pale, atrophic and flattened. The atrophy was so marked in some cases that it was at first sight difficult to decide which was the mucous and which the serosa. A few cases showed true ulceration of the bowel resembling bacillary dysentery. Various degenerative changes were found in the liver and apart from diminution in size, other organs presented no gross macroscopic changes.

Post mortem investigations were carried out by a group of medical students under the aegis of Dr A P Meiklejohn, of UNRRA. Many samples were taken for histological examination and it is understood that a much more detailed report will be issued in due course.

Conclusion

This report describes the laboratory work carried out on patients removed to hospital from Belsen Concentration Camp.

Unfortunately, the conditions prevailing in the camp during the first weeks after liberation prevented any comprehensive pathological investigations being done.

But it is thought that the data here presented provides an approximate picture of the incidence of disease in the camp.

Although some cases of enteric fever and diphtheria were found, it is remarkable that they were confined to so few, which suggests that we were dealing with a herd, the majority of which was either immune or had died as a result of these diseases.

Similar conditions of starvation and overcrowding in a less temperate climate would have added to the pathological problem.

From: Majors A P Prior and E M Griffin, RAMC.

P.S. We cannot sufficiently express our thanks to Lieut Col J A D Johnston, MC, RAMC, SMC, who carried out post mortem investigations in Belsen Concentration Camp but we would like to record our indebtedness to him. Among the medical students that we would wish to thank are Messrs A G Razor, D G A Westbury (Guy's), J Stephenson (St Thomas's) and J A Turner (Guy's) who have helped us considerably.

The following is a selection of post mortem reports, some were typed on paper headed PANZERTRUPPENSCHELLE KOMMANDO MUNSDORF, KREIS TELTOW and filed in a buff coloured folder stamped RESERVLAZERETT LABORATORIUM BERGEN b CELLE. Major A P Prior, RAMC.

Case No. 3 Havas Teresa aged 26. Hungarian. 14.5.45.

Clinical History: 6 weeks in Belsen. 1 year in other camps. Five days ill unable to walk. Diarrhoea very bad for two weeks. Oedema has developed in feet, hands, and face. Cough, bad. Has had a fever but says it's not typhus, says she has not passed water for five days.

O E. Cross oedema of hands and feet and some of face. Abdomen lax and uniformly distended. Bladder not palpable.

Post Mortem

General appearance: Adult female, malnourished and slightly jaundiced skin. Conjunctivae not yellow but showed subconjunctival haemorrhages. Scabies of abdomen. Gross oedema of lower limbs extending approximately to knees. None of hands or
knees. Very little subcutaneous fat which appeared somewhat orange.

**Pleural cavity.** Few adhesions at bases. About 2-4 ozs fluid in each side.

**Pericardial cavity.** Fluid about 3 ozs.

**Peritoneal cavity.** Small amount of free fluid. Many firm adhesions between abdominal contents.


**Abdomen:** Many firm adhesions between abdominal contents. Liver enlarged two to three times normal size, orange in colour, very friable and soft, liver pattern normal. Spleen very soft, rather congested, enlarged but not grossly. Pancreas and suprarenals appear normal. Both kidneys are enlarged. Right ureter thickenened throughout its length and right ureteric orifice enlarged. On section characteristic appearance of caseation. Tuberculous right kidney. Left kidney appeared rather pale but otherwise normal, about 1½ times normal size, left ureter not thickened. Bladder contained about 40zs urine; very small; epithelium showed patches of hyperaemia.

**Alimentary canal:** Pharynx, oesophagus, stomach, ileum show patchy hyperaemia, duodenum and jejunum normal. Colon somewhat hyperaemic, contained liquid faeces, mucous membrane showed ulcers of varying sizes throughout its length. Mesentery grossly thickened. Firm adhesions throughout peritoneal cavity. Many enlarged and calcified glands.

**Liver, 1250 grams, pale, nutmeg tubercles on the surface. Spleen 100 grams, normal. Right kidney 120 grams. Left kidney, 130 grams, pale, capsule normal.**

**TB glands in mesentery, porta hepatica, mediastinum.**

**Case No. 16. Falla Schlesinger aged 25. Polish. 23.5.45.**

**Clinical History:** Severe diarrhoea. Cough 3 weeks. Slight oedema feet. Considerable wasting. Weight 33Kg.

**Post Mortem**

**General appearance:** Female not grossly emaciated. Oedema, moderate of feet.

**Chest:** Right side, pleural effusion, 10 ozs clear yellow fluid. Right lung, 450 grams, numerous infarcts especially in lower lobe. Thrombi seen in pulmonary vessels. Left lung, 310 grams, no effusion, small areas of infarction in lower lobe. Area of gangrene at left base in area of old infarction extending to surface of lung at site of an adhesion—foul smelling breaking down area approximately 1½ inches diameter. Heart, 255 grams. Pericardial effusion.
sion, 1 oz. Considerable pericardial fat. Muscle pale. Antemortem clot in both ventricles extending to aorta and pulmonary artery and traced as far as the lungs. Several vegetations of rheumatic type in mitral valve.


To set the record straight.....

The first individual to enter the camp was the Divisional ADMS Colonel D Bluett who went in about midday on April 15th.

The first medical unit began work in the camp at approximately 4 p.m. on April 15th. This was the Divisional Field Hygiene Section.

This was the only medical unit working there until April 18th. It spent the first two days completely within the wired enclosures and during the first 24 hours the S.S. men were still in control of the camp.

It was due to the foresight of Col Bluett that supplies of A.L.63 and disinfectant were available for the first effort.

Up to the afternoon of the 18th when another field Hygiene Station came up, some 15000 inhabitants of the camps had been deloused.

The fact that the 11th Armoured Division provided some troops, water carts, the greater parts of its hygiene section and its whole laundry and bath unit while active operations were being carried out, is deserving of mention in any account of Belsen.


Not forgetting the Nursing Services.....

In the recent literature on what has been done in Belsen Camp, reference has been made to the excellent work of medical students, research teams, civilian workers and combatant units, but so far no mention has been made of the work of the Army nursing sisters.

Nursing Officers of the 32 CCS and 9 Br General Hospital were in the hospital area from the earlier days and some account may be given of the conditions under which they worked.

The hospital was divided into blocks holding 150 beds and subdivided into rooms of four to eight patients; one sister was in charge of each block, helped by one British orderly and an inadequate number of internees later replaced by Germans. Patients were admitted at the rate of about 500 a day, beds consisting mainly of palliasses on the floor.

It was estimated that 80% had diarrhoea, most were confined to their palliasses and there were 2 bed-pans to each block. The results are imagined.

Food distribution was a major problem, all the patients had an insatiable hunger and were invariably dissatisfied with the amount they got; free fights between the different races were a common occurrence at meal times. Hoarding was almost universal and nearly every bed had mangled scraps of bread, butter etc. hidden under the mattress or blankets.

Deaths to begin with were numerous and it was a common occurrence to find several dead in bed on the morning round. The language difficulty precluded conversation even with the workers, who had to be instructed in their duties by means of signs and demonstrations.

Working under these conditions in close and constant contact with the patients the Army sisters showed a willingness and initiative that deserves the highest praise. The skill and cheerfulness with which they dealt with the patients, obstinately refusing to be put off by sights and smells, must be reckoned as a major factor in the rapid recovery, both mental and physical, of the patients under their care.

It is noted that many of the sisters came to Belsen immediately following a hectic and gruelling time dealing with the casualties of the Rhine crossing, and at the end of nearly a year's service with the B.L.A.

From: Major Hilda Roberts and Captain Petronella Potter, RAMC (Brit Med J 1945: 21: 100)

... and our USA Allies

A tribute should be paid to Lieut E J Murphy, to Paul Dupont who offered his services as a stretcher-bearer and to the personnel of D Platoon, 567 RASC (American Field Service).

This unit consisting of volunteers from the USA carried out magnificent work in helping us to clear the horror camp. Nothing was too big for them and I have never known men so hungry for work or more willing to co-operate in any task.

SECTION III

The Students Story

At the end of April, 97 medical students from the London Teaching Hospitals arrived, and their advent provided a very valuable addition to the number of personnel available for supervision. In fact it was reported that from the date of their arrival a very definite decrease in the daily death rate occurred. Much greater supervision of feeding and treatment became possible by the attachment of a student to each hut.


Belsen 1945

During early April a notice appeared in the Medical Schools of the London Hospitals asking for twelve volunteers from each to make up a party of a hundred students whose object would be to treat starvation cases in Holland under the auspices of the Red Cross. The response was excellent and there were far more volunteers than places, so a ballot system was introduced. The twelve students chosen waited for the imminent liberation of the Dutch people.

After waiting around we were issued with passports and important looking papers which we were told never to be without unless we wished to be shot as spies. At that time it would have needed more than papers to convince anyone that we had any legitimate reason for being in Europe. Then it was mentioned in as kindly-fashion as possible that our destination was Belsen, and everyone now realised the seriousness and impact of our task ahead.

On May 2nd we took off, and after four hours flying we landed in Celle, which had been in German hands until three weeks previously and which was now a busy transport-cum-fighter aerodrome.
The next day we went down to Camp 1, or the concentration camp proper. Conditions there were reasonable until February when the camp became the terrible cesspit that it was when the British liberated it. The two main factors which contributed to this were first overcrowding and secondly typhus.

The overcrowding was due to the reception at Belsen of many internees from camps that were about to be overrun by the Russian armies, such as Auschwitz. The typhus epidemic was due to the non-segregation of a group of Hungarians who had been in cattle trucks for ten days before they arrived at the camp, and many developed typhus. Naturally conditions were perfect for the spread of the disease and any other disease, due to lack of sanitation and to crowded conditions.

The situation was therefore grave and as fighting had not yet ended the number of available RAMC units was four. In spite of this, miracles were performed by the RAMC and the RA. The inhabitants of the hundred huts in Camp 1 were not supervised medically or dietically and were dying at the rate of 500 per day. So when we came to the camp on May 3rd our primary objective was to supervise the huts. Therefore we were allotted a hut or a group of huts, in the main working in pairs.

Our appearance raised morale amongst people who were beginning to think that they had been forgotten by the civilised world and what was more important ensured equal distribution of food. Medically there was little we could do during the first fortnight, because the few drugs available were limited in supply and nursing help was non-existent. To explain to a Pole who speaks a little French how
to give a course of sulphonamides to a Russian with erysipelas is no easy matter.

We usually managed to give a pill of sorts to all, which was of great psychological value. In most cases apathy soon changed to interest.

Our main problems were starvation and diarrhoea as by now typhus was on the wane as most of our patients had contracted the disease and were now convalescent. DDT proved very effective against lice. It was possible that the typhus that was contracted late was mainly dust-borne.

Starvation was widespread and extreme examples were common. Protein hydrolysate was unfortunately not as successful as was expected, the use of plasma in famine oedema was again attended by very dubious results although later work in the light of earlier experience showed that it was efficacious when given slowly.

The intractable diarrhoea encountered was of extreme discomfort to the patient, to nurses, and to ourselves. The theories as to aetiology were many, ranging from avitaminoses to bacterial infections. Treatment was just as obscure. The drugs used with occasional good results, were opium, Albucid, sulphapyridine, Tannalbin (a German preparation supposedly equivalent to our sulphaguanidine), nicotine acid, chalk, charcoal and kaolin.

Tuberculosis was another problem with which it was quite impossible to cope; on clinical grounds almost a third of these people had tuberculosis, and radiologically probably more. All we could do was attempt to segregate them.

T C Gibson (London Hospital).
From: The London Hospital Gazette 1945; 48: 145.

Belsen

When we arrived on May 2nd a gunner regiment had already been hard at work for a fortnight clearing the dead from the pathways, getting them burned, and organizing work in the cookhouses, so it was left to us to start work in the huts themselves, which so far had been left untouched. Each hut was about 30 by 10 yards with absolutely no furnishings at all in the majority. The main floor space was covered with a mixture of the living and the dead. stale food, faeces, old clothing and filth of every description, and there were approximately 600 living in each, having at one time been as many as 1000.

When we first went in the combination of the smell and the general appearance was enough to make us wonder if it was possible to do anything but it seemed reasonable enough to make a start on moving out corpses and this, with the aid of two Hungarian soldiers each, was the first work we did.

Having cleaned up the place as much as possible the next problem was that of feeding and this remained a major problem to the end, and as we were largely responsible for the distribution of food and also for suggestions of changes and modifications in the diet we had a lot to answer for. Dr Meiklejohn of UNRRA, a dietician of considerable standing, was in charge of our work, and we had daily conferences with him and with the gunner officers in charge of the kitchens to see what might best be done.

The first experimental food tried was Bengal Famine Mixture which we were assured had worked extremely well in Bengal last year and seemed to be just what we wanted. This is a thick gruel made of sugar, dried milk, flour, salt and water (20Kg sugar, 12Kg milk, 15Kg flour, 5Kg salt to 300 litres of water); a litre of which provided sufficient nutrition (plus vitamins) for one man per day. At first this answered our problem as it was acclaimed on all sides but after one or two days it failed us and was rejected on the grounds that it was far too sweet and caused diarrhoea.

Apart from this we had with us a large supply of glucose-vitamin and protein hydrolysate mixture which was given in a number of different ways nearly always unfortunately with limited success. The theory of its use being that under starvation conditions liver function becomes impaired to a degree when it becomes impossible to katabolise proteins, therefore to give pre-digested protein-amino-acid form is all very well, but the question of practicability and whether in point of fact it is possible to administer the stuff under the conditions which co-exist with starvation is another matter, and we found it more or less useless. Given intravenously it had a marvellous effect in some cases and made gross starvation disappear overnight but in others the oedema became far worse and it had to be stopped. And in any case there was no control done to discover the effect of dehydration alone, and it might well have been this, combined with the attention given to the favourable case which caused the improvement. In the huts of course intravenous work was out of the question. As another example of the difficulties of administration, we found that if an attempt was made to segregate one or two cases to one end of the hut in order to try out some treatment, the moment the stretcher bearers arrived a piteous wail would begin 'Nix crematorium. Nix crematorium' and it was with the greatest difficulty that we were able to persuade them that we were not taking them for burning. Many of them had been forced to watch their relatives fed into the ovens.

The prospect of passing a nasal tube—just a length of soft rubber tubing cut from a roll as we had no proper Ryle's tube—with no lubrication and no ready facilities for washing, let alone sterilisation, was enough to put us off.
In fact milk, of which we had very little fresh and only dried powdered, was the only starvation diet which seemed to be universally approved; even this of course needs instant attention and nursing care to get sufficient down.

Colonel Pollock of the US Army who came to speak to us one evening said he had had excellent results with a custard made of dried milk and powdered egg in cases of starved POW's he had had under his care. It would have been interesting to see how it would have been accepted by our patients. White bread, white potatoes and non-bran cereals formed the rest of his diet sheet but all these commodities were simply not to be had at Belsen.

R P Dixey (Bart's).
From: St Bartholomew's Hospital Journal 1945; 49: 76.

Belsen, May 1945

The main body of the medical students started work in the concentration camp on May 2nd. On our first day we were allocated huts, two of us getting Hut No 213 in the women's compounds, the number of inmates being estimated at 1045. We were dusted with DDT at the gate and Whimster went off to get some drugs which were being issued while I went down to find the hut. It was at the far end of the camp, and was about 120 feet long by 30 feet across, painted red. There was a Russian flag flying over it.

The whole camp smelt vile but the inside of that hut was worse; unfortunately the English tongue cannot describe smells, and the only way to bring it home to people here would be to bottle it and fly it across by plane. I went back into the hut again and found absolute chaos inside.

At this point Whimster turned up with medicine which consisted of 20 opium tablets 0.03gm, 30 aspirin, some tannalbin, which is a German preparation that we had not heard of before, three 3" bandages and a packet of gauze.

We took a look around—there was faeces all over the floor, the majority of people having diarrhoea. I was standing aghast in the middle of all this filth trying to get used to the smell which was a mixture of post-mortem room, a sewer, sweat, and foul pus, when I heard a scrabbling on the floor. I looked down in the half light and saw a woman crouching at my feet. She had black matted hair, well populated and her ribs stood out as though there were nothing between them, her arms were so thin that they were horrible. She was defaecating, but she was so weak that she could not lift her buttocks from the floor, and as she had diarrhoea, the yellow liquid stools bubbled up over her thighs. Her feet were white and podgy from famine oedema, and she had scabies. Later on, we tried to pass a nasal tube on her, to give her protein hydrolysate, but her nose was so atrophied and blocked, that we could not get the thin tube down, and part of the nasal conchae came adrift on the end of it.

But the floor was a minor consideration compared to the beds and the people. Most of the bunks had inmates, some two or three, and they were all smeared with faeces, because the people with diarrhoea did not bother to get out of bed. The result was that urine and faeces dribbled through the wooden boards of the two top bunks on to the lowest one, and as this last was the least comfortable, all the dying and weaker patients could be found there.

We held a sort of pay parade, Whimster going round those unable to walk, while I issued a cigarette and a sweet to the walking. We estimated that there were 138 who could totter, 300 bedridden, and about 20 fit. We found thirteen dead lying around the place and got them carried out.

The diseases were too numerous to cope with; diarrhoea was common, a large number had famine oedema, most of them had bedsores, which covered the whole of their buttocks—this is hardly true, because the Belsen buttock was not convex like ours, but concave, so that the patients lay or sat on their bones, and the result was bedsores on the bony points—and scabies was everywhere. At first we thought some of the scabies was pellagra, because the hands were covered with a scabby mass of sores and dirt; however the distribution was wrong, the whole body being involved. They used to scratch it and promote infection, so that huge hot ischio-rectal abscesses were common.

There were plenty of walking skeletons, and some of the people were so emaciated that there was not enough fatty tissue to support the rectum when they defaecated with the result that the rectum collapsed.

We dressed those of the wounds which were bigger than half crowns and gave opium tablets for diarrhoea as well as tannalbin and charcoal, while the rest got half an aspirin chiefly for the good of their souls. We got some soup for them that day and withdrew about six o'clock to consider the situation.

The Saturday when the Jerries gave in to the British was one of the best days we had. The hut was cleaner, and the patients sang to us. Food was good. There were potatoes, about three small ones each, lemonade, brown soup which was hardly touched, Bengal Famine mixture, consisting of flour, sugar, milk and salt flavoured with leeks—very popular but too sweet and there was less than half a pint per patient. The fit ones had a slice of bread and cheese or meat. Six died that day. The only
grimm thing was an old woman, who sat about a hundred yards away from the hut and howled her head off, because all her lower jaw and the floor of her mouth was gangrenous and falling to pieces—we had no morphia.

If Saturday was good Sunday was chaotic. In the morning there was some sort of political fight going on between the Poles and the Russians, but we brought in a Sten gun and threatened all sorts of trouble if they did not subside, which luckily they did, but not before they had increased the number of dressings to be done that day. An RAMC officer also turned up and evacuated the more mobile of our patients to one of the other camps. Four died that day.

On the Monday there was a grand evacuation, and we were left with 116 Germans, 20 Poles, and 64 Russians, these last being ordered to go but refusing because their Kommissar had told them not to do so. The sick were taken away by a super-efficient American Ambulance service, run by a very cheerful bunch of Yanks, and were transported to the human laundry, run by the Army, where they were deloused and scrubbed and returned to a hospital hut. These huts were ordinary ones in the women's compound, which were scrubbed out, lysoled, smothered in DDT, then filled with clean two-tiered beds, with a new palliasse, three blankets and an undersheet of paper each. Paton and Cook were two of the first to turn their hut into a hospital one, and we were very envious when we saw how clean and tidy it was, with lilac on the tables, and incidentally an SS woman working incog as a nurse.

We got a lot of vitamins into the people that day. Two died. The evacuation went on all day. Ferguson turned up with a squad of Hungarian soldiers, whom he put on to cleaning out the hut, prior to making it a hospital—though we still had about 50 patients at one end. The death rate was nil, chiefly because they were too interested watching Ferguson ordering non-English speaking Hungarians around in English.

The cleaning business went on all over Wednesday, and as fast as beds were rigged, patients came in to fill them. With the help of ten "nurses", whom we picked from the fitter patients, and who were mostly pregnant, we got them all into bed, and began to get organised as a 'hospital' of 126 beds, with three students and three untrained nurses. Some sanitary towels arrived (German pattern, Mark 1, I should think) which were very popular, for storing surplus sugar!

The first day of our new hospital was awful, as all the patients were disgruntled, and more were coming in. However we were very conceited about our new hospital, and anyway we were very happy because we had no longer faeces all over our boots when we came back to the mess at night, and we could get near our patients without having to do acrobatics amongst the bunks. We even felt we could sit down on chairs without looking first—actually we were wrong about that!

The mental state of the patients was on the whole better. In the beginning they all used to cry 'Herr Doktor, bitte schon. Herr Doktor, Herr Doktor' and would clutch at our sleeves as we went by. We used to go regular rounds, but even after we had passed, they would cry for us to come back again so that they could tell us their pitiful tale over and over again! 'My mother and father were burnt alive in Auschwitz?’, ‘Will I ever be beautiful again, Herr Doktor?’; ‘My husband was flogged to death by the SS’.

We still had very few drugs but the supply of vitamins was adequate, and we were using saline or flavine dressings. Coramine was in constant demand for it seems to be as popular on the Continent as a daily dose of salts here. But we had no means of sterilising a syringe, even if we had had one, or even if we had, we would not have given coramine. Syringes were tricky things to wave around in place, as were stomach tubes, as the SS seem to have had an unpleasant habit of injecting people with benzene, to see what happened, and the sight of a syringe caused hysterics.

In the next few days we managed to take case histories, and I shall include a few to give a rough idea of the people's general condition.

Case Histories

Edith Lana, aged 15, German: Distal phalanx of her left big toe was completely denuded of soft tissues, and the bone was left sticking out. The rest of the big toe and second and third toes were gangrenous resulting from the treatment at Auschwitz, where the women were driven into the snow and left there.

Yolan Weiss, aged 21, Jew: Scabies all over. Oedematous feet. Gross emaciation and anaemia. Diarrhoea, about 25 times in 24 hours—she lay continuously on a bed pan. Cough with blood in the sputum. Bedsores on her bony points, the longest 4in by 2in. We treated the bedsores with dry dressings, and they cleared up: the diarrhoea was never controlled though we gave her three opium tablets a day, as well as six tannalbins and nine nicotine acid tablets. We tried her on protein hydrolysate by mouth and got two pints a day into her; there was no improvement after three days. She also received three pints of twice concentrated plasma from the Army Transfusion Unit that turned up, but she died on May 19.
Weitheimer, aged 44, Czech: She originally complained of diarrhoea, which was controlled with one opium tablet a day, and she became fairly fit, until May 15, when she suddenly lost her voice and ran a temperature. She had a patch of dullness on her right lung, and bubbling noises there, so we put her on sulphathiazole. She died next day.

The case histories could go on for a long time as we had many interesting cases. There was a woman with acute nephritis, coupled with starvation oedema and cancer oris, so that her oedematous face was a white jelly, except where the lesion had scooped away half her lower lip. She was incontinent of everything, and had gross diarrhoea—we could do little to help her.

There was a woman with an abscess on the front of her tibia with the bone showing, which used to produce about half a pint of pus a day—it smell. There was a woman with post-typhus gangrene of both her feet and one hand, coupled with the usual emaciation and diarrhoea. Practically all had scabies, which was eventually controlled by three applications of Mittegal, a German preparation, when we got it. The death rate in the hospital was about six a day to start with, dropping to one or two. Anyway each of us devised our own pet methods of treatment, probably wrong, and each of us was certain, at first, that his method worked.

If this account seems to be very full of ‘I did this’ and ‘I did that’, it is only because I have tried to give nothing but first-hand information, and it must be realised that every other medical student worked under similar or worse conditions.

Alan MacAuslan (St Thomas’s)
From: St Thomas Hospital Gazette 1945; 43: 103.

Belsen

We arrived in Celle at 10.30 am, after four hours in the air. We waited four hours at the aerodrome for transport to Belsen for, although RAF trucks were going there soon after we arrived we had to wait for RASC trucks from Belsen. I suppose these letters painted on the sides do make a difference but to our undisciplined eyes they all looked empty trucks going in the same direction. On Wednesday evening we arrived at Belsen.

The following day we saw for the first time the victims of German glory. We had arrived a fortnight after the camp’s liberation; the dead had been buried in common graves containing 3000 or 5000 corpses each. The official figure of 10000 unburied corpses at the time of liberation was later given. It is hard even for those who saw the camps after such a short time to imagine the difficulties and chaos of those first days and to appreciate the miracles of organisation performed by the RAMC and the Army authorities at the camp. The almost complete lack of communications and the isolation from higher authority, a state of affairs which was little changed even at the time of our departure, permitted a free play of the most inspiring energy and initiative.

A gigantic task had faced a small medical team consisting of 32 Casualty Cleaning Station, 11th Light Field Ambulance, and 7th Mobile Bacteriological Laboratory. They were later joined by 30th Field Hygiene Section, 9th British General Hospital, 163rd Field Ambulance, 35th Casualty Cleaning Station, Medical students at the beginning of May and 29th General Hospital at the end of May.

I was particularly interested to meet Capt ‘Frosty’ Winterbottom RAMC, a Mary’s man, who was anaesthetist to the 32 CCS. ‘Frosty’ was certainly one of the best known of Belsen personalities. He was officially in charge of hospital stores and his fame is well founded on his achievement in equipping the 7000 bedded hospital area proposed in Colonel Johnston’s first report. With knowledge of only negligible stocks
of medical ordnance stores available, by scouring
the district and 'freezing' all he could lay hands
upon, Capt Winterbottom equipped 7000 beds at the
rate of 1000 each day. The camp when we arrived
was fairly orderly but the state of the sick in the
huts was appalling. In the huts in which I worked
about 200 to 300 people were crowded in enough
space for 80. They were in three-tiered wooden
bunks with barely space to pass between; there were
in addition many lying on the floor on piles of dirty
rags. The three great troubles were typhus, starva-
tion and almost universal diarrhoea. The two latter
conditions were allied in that the food provided after
the long period of starvation was unsuitable for
weakened digestion tracts and resulted in severe
gastro-intestinal disturbances. The psychological
condition of the internees was also of importance and
with the language problem added greatly to our diffi-
culties. And even here, in these sorry circumstances,
nationalistic prejudice caused trouble, particularly
between the Russians and the Poles. Amongst the
fit, even doctors and nurses, there was, at first an
almost complete indifference to the fate of the sick.
Those who were well enough to get food over-ate,
with a great increase in the rate of diarrhoea, while
those who were too weak were left to starve.

Our primary function, therefore, was to ensure the
proper distribution of suitable food to all internees.
In this we worked under the direction of Dr Meikle-
john an old Mary's man working for the Rockefeller
Institute with UNRRA. His calm diplomatic hand-
ling of students and the higher authorities greatly
added to the effectiveness of our efforts. We first of
all kept a record of the numbers feeding from each
kitchen (about 5,000) and also each day provided
figures of the fit, sick, typhus cases and deaths. The
death-rate was about 500 a day and dropped to 80
after 10 days. A student attached to each cookhouse
correlated this information and saw that the correct
amounts of the different kinds of food were pre-
pared and distributed. It was equally important for
a student to be present in each hut at meal times to
see that the sick were fed.

I have nothing to say about the use of protein
hydrolysate or intravenous plasma and serum in
starvation. In the huts intravenous work was im-
possible and only extremely limited use of hydroly-
sate was practicable. Those who could take nothing
else because of weakness or diarrhoea were given a
glucose vitamin mixture. Many required great urging
to take anything at all. There were various gruel-like
concoctions made with dried skimmed milk, the most
famous being the Bengal famine mixture. Strangely
enough although the proportion of sugar was de-
creased and salt increased, and although the patients'
energy reserves were so sadly depleted, the constant
complaint was that the mixture was too sweet; there
were also soup or stew and jacket potatoes for those
fit to eat them, and popular with all, a brew that
went by the name of tea.

Typhus, in the presence of a known epidemic, we
diagnosed by the high fever and violent headache
often leading to delirium, tinnitus often followed by
deafness, which continued during the weak, apathetic
and sometimes mentally deranged condition known
as the post-typhus state. The spleen was sometimes
palpable. The appearance, speech and gait were best
described as drunken. About the fifth day of the
fever the typhus rash appeared on the trunk, inside
of the legs or arms. This was paler than a measles
rash and in dirty, flea-bitten patients not always easy
to distinguish. The dehydrated state and dirty mouth
often lead to violent parotitis. There were fatal chest
complications and some gangrene of the extremities.
I have heard it said that in typhus the hair falls out
after convalescence grows again, but we did not
observe this happen here. For the headache we gave
aspirin and for the rest could only give the vitamin
and glucose mixture. The parotitis mostly cleared up by
sometimes required drainage. The deafness often
persisted. The mortality rate was estimated at be-
tween 10-20% at the age of 20 and was said to be
almost 100% at 50. A comparatively large number
of RAMC personnel (30 or 40) contracted the disease
and also half a dozen students (none from St Mary's):
All of these had been inoculated against typhus although
some of the students only an extremely short time before. There were no deaths amongst the
inoculated and the disease was said to be of about
25% the severity seen in the non-inoculated.

I did not hear of any proven cases of bacillary
dysentery. The diarrhoea was due to weakened
gastro-intestinal condition and the unaccustomed
food and was very difficult to influence. We used a
German drug 'tannalbin' but were quite ignorant of
suitable dosage. Eventually three tabs every two hours
to a total of 12 seemed to have the desired effect in
some cases, also a chalk and opium mixture appeared
which helped.

Constantly the fit were being evacuated to Camp
111, and the sick to the Hospital Area—Camp 11.
The hospital accommodation was as follows, 7,300
beds to be taken over by the 29th General Hospital
and 4,000 beds under 9th General Hospital. In this
way a hospital area was formed in the women's part
of the Camp, in clean huts with patients treated by
a Mobile Bath unit before admission. This area was
controlled by a group of students, largely U.C.H.,
and good internee nurses, and was a great credit to
them. Colonel Johnston reported, 'In my opinion a
higher standard of care and treatment is being
achieved here than in any other hospital area, the
reason being the adequacy in numbers of staff
employed there!'
By the middle of May thanks to DDT the typhus epidemic was on the wane, and the sick evacuated to the hospitals in Camp 11 and to a nearby German military hospital. This hospital was soon renamed the Glynn Hughes Hospital after Brig Hughes DDMS 2nd Army who was our most cheering and inspiring guest in the Mess.

Work was now started on burning the empty huts, although the Camp was not yet completely evacuated. On May 21st with suitable ceremony the last hut was destroyed and those who were not already there went to work in the various hospitals. Here it was possible to give more individual medical attention to patients and with the arrival of fresh RAMC units and equipment Belsen standards were gradually forgotten.

Tuberculosis was raging and was being diagnosed by physical signs in 20% of patients, who were then segregated. Serum and plasma were poured into the starvation cases with varying results. Some blew up more than ever and paracentesis abdominis was frequently performed. The surgery was rarely aseptic and hardly needed to be; it was, at any rate, good to see the pus flowing freely after its long imprisonment. But with the 29th General Hospital we welcomed a goodly contingent of nursing sisters; discipline was re-established; we learnt our place—it was time for us to go.

John Hankinson (St Mary’s).
From: St Mary’s Hospital Gazette 1945: 51: 76.

Expedition to Belsen

An Account of the Experience and Findings of the Eight Middlesex Students.

Belsen. It’s an inoffensive name, the name of a tiny village in the heart of Germany, unheard of before April of this year, yet headlined to eternity now in infamy. For here, close by, lay one of the foulest of NAZI concentration camps, monument to bestiality such as this are indescribable, but in it were compounded the stinks of faeces, decaying flesh, burning rags and the warm, sour, acid scent of human sweat. Then we saw the camp for the first time. Half a square mile in area, it held 28,000 persons. They lived in wooden huts which were much the same size as E.M.S. hospital huts. They were all dilapidated and falling apart, roofs holed, windows broken, floorboards collapsed, and drains stopped up. No light. No water. In many huts no beds or bedding of any kind. And under these conditions lived not forty people, as in an E.M.S. hut, but some 600! It was impossible for anyone to lie down at full length. Instead they had to stand or huddle up on top of one another on the floor, the sick, the starved, the dying and the dead—all one huge, wretched, seething mass of disease-riddled, vermin-infested, stinking humanity. The stench in the huts was almost more than we medical students, brought up though we are to meet bad smells unflinchingly, could bear, for universally the floors were carpeted—literally—with a thick glutinous mass of weeks-old excreta. The reason? Weeks before, such sanitary arrangements as were provided in the huts had become defunct and yet the SS guards, knowing this as they must have done, had forbidden the inmates to defaecate or urinate outside the huts on pain of death. There was no alternative, therefore, and in the majority of cases the people had become too apathetic to care or else too weak to move, and remained where they were, saturated time and time again with their own excretions (nearly all suffered from a fulminating diarrhoea) unconcerned, unashamed.

The lack of shame, this apathy, this regression to
sheer animality was evident on all sides. Men and women would walk around the camp stark naked, cold as it was, and think nothing of it; they would sit side by side on the latrines and gaze on passers-by unblushingly, expressionlessly. Before long we ceased to marvel at the sight of emaciated figures crawling out of their huts with eating bowls in their hands which they had first used as bedpans, emptying them down the nearest latrine, wiping them on the filthy rags that served them as clothing, and then returning to the huts to take their meals from these self-same bowls. And when the food was brought those that were strong enough would fall upon it and fight for every morsel they could obtain, thinking only of themselves and caring nothing for those who could not move and who consequently went without, all gibbering unintelligently in high-pitched tones the while like a swarm of angry monkeys. Death was meaningless for them and corpses reviled them not a bit; we would do “corpse-rounds” each morning to pick out the dead in much the same way as a nurse would do a T.P.R. round here in England and with the identical atmosphere of routine normality.

Only intense and prolonged suffering could have produced the extreme mental, moral and physical degradation that we witnessed. These people were utterly broken, spiritless, amoral. The world had offered them only misery; why then should they care about the world?

Physically the most startling sight was the degree of emaciation to which they had been reduced. “Skin and Bone” here was a literal description. Their heads were no more than parchment-covered skulls, their thighs could be circled by finger and thumb and it was easy to grip the bones of their vertebrae through their anterior abdominal walls. Their muscles were mere fibrous strands and the women’s breasts just wrinkled flags of skin. Famine oedema of the ankles and sacral region was widespread and in occasional cases ascites due to starvation were found. Bedsores and ulcers, some deep enough to expose bone, were to be seen everywhere, and nutritional, post-typhus and thrombotic gangrene of the extremities was not uncommon. Few if any definite vitamin deficiency syndromes were diagnosed—there were several doubtful cases of beri-beri, pellagra and scurvy, and the diarrhoea may in part have been due to nicotinic acid deficiency, though intensive therapy with nicotinic acid had no remarkable effect on it. Chest troubles were legion, a very large percentage of them being almost certainly tuberculous (one could not be certain in the absence of facilities for sputum examination, radiography, etc). Femoral and iliac venous thromboses were common mostly following typhus, many cases of which were seen at the height of the fever and many more who had recovered from it. Amenorrhoea was universal among the women who all declared that this was due to some drug which the Germans had given them, though we were unable to find out the nature of this drug. Extensive scabies was present in 30 to 40 percent of the cases and many other skin conditions had not far to be looked for. Isolated cases of malaria, diphtheria and cancrum oris (foul mouths, carious teeth and sore tongue were the rule) were met with, also tonsillitis, and dysphagias of indeterminate cause besides such incidentals as heart lesions, gastric ulcers, piles, prolapsed rectum, pregnancy etc., and surgical emergencies including acute appendicitis, obstruction and retention.

That, in brief, was the general medical picture which lay before us, set against a background of unreproducible squalor. No attempt could be made to take accurate histories because of the language difficulties and often it was impossible to examine cases because to do so would have meant kneeling on two or three people beside them. Immediate action was imperative and we delayed to act not a moment.

The biggest problem was that of improving living conditions. A team of 10 student volunteers set to work on this on our second day at Belsen. We had to start from scratch. First the huts had to be scrubbed out with cresol, then dusted with DDT powder: beds (2 tier bunks) found, scrubbed, and dusted, palliasses and blankets obtained, patients brought in and passed through the “human laundry” nursing staff organised from the fit internees, feeding utensils, bedpans, drugs and instruments secured and a multitude of other small details attended to. By the end of the first afternoon we had bedded down some hundred patients and by the end of the twelfth day our hospital area comprised twelve huts containing about eleven hundred patients.

Our hospital established, medical work was begun in earnest. Perhaps the most striking and worthwhile result that we achieved was the change in the people’s outlook. Apathy had gone from them. They no longer stared or grimaced in terror when approached by a man in uniform. They thanked us now for what we did for them and were anxious to talk to us and hear news of the outside world. Their sense of shame and decency had come back. Hope was rekindled within them.

So came the end. Two RAMC hospitals and 150 Belgian medical students took over from us on May 26 and after we had shown them the ropes on May 28 we boarded the plane for home.

This is our story, or part of it. We shall remember Belsen for many a day, not only for its wretchedness, but also for the many lessons it had to teach us; for the comradeship and team spirit we found among all with whom we came in contact: for the hardest and
most worthwhile month's work of our lives. It was an invaluable experience and none of us regrets the time spent there.

We regret but the cause.

G Raperport (Middlesex)

*From: The Middlesex Hospital Journal 1945; 45: 21-24.*

**Belsen Concentration Camp. (The Fiery End)**

Monday 21st up at 8 o'clock. Went up to the round, all the patients were looking much better, more cheerful, much more interested in what was going on around them and they were all grumbling about the food etc which is quite a good sign I think.

Had a look at the two cases which had been given the 5% I.V. Casein Hydrolysate, in neither case had it had any effect upon the oedema, though in both cases it had made them stronger and more interested in things, and in one case the diarrhoea had gone, but as she had also had Mist Opio and Kaolin, difficult to know which one got rid of the diarrhoea.

There was another interesting case in Ward 12, young girl aged about 19 with unilateral oedema of her right leg from the foot up to and including the right Labium Majus. She had a history of sudden onset with pain in the RIF and the oedema is now subsiding gradually. Made our diagnosis of ? External Iliac Vein Thrombosis.

Another woman who had multiple small superficial abscesses all over her body ? Avitaminosis and so doused her with Army Compound Vitamin Tablets.

In Ward 1 there was a girl with multiple deep discharging ulcers down the inner side of her left leg, with massive oedema of the foot. We were not sure what this was, so we showed it to Major Walker, the Army surgical specialist, who was coming around in the capacity of Consulting Surgeon. He diagnosed it as a case of supplicative phlebitis and advised raising her leg and flavine dressings—dressed the leg and raised it on a box padded with curtains—girl was only 15 so I gave her 15g Aspirin and 1/2gr Phenobarbitone to send her to sleep.

Also decided to raise the foot of the girl with unilateral oedema and did so with another box.

My diagnosis of caseating glands was confirmed despite a rival suggestion that it might be Actinomycosis.

After lunch I rewrote several of the case sheets at the end of the beds and gave out any tablets which were needed for diarrhoea, pain, headache etc. We did not have any drips going today and I did not want any more Hydrolysate as it is no use for the oedema—the only thing which touches the oedema is double strength plasma and several other people have had a 25% mortality from this—so I am rather wary about using it; nevertheless I think there are two cases which should have it.

The girl we transfused with whole blood is much better, her diarrhoea is going but she has got a bit of fever now—don't know why. I think she is one girl that we have quite definitely saved from dying as in the hut at one stage we had labelled her Status Gravis and now she is asking for chocolates and cigarettes.

The woman with the fever, which I think is typhus, still has a raging fever and suffused appearance but still got no rash.

At six o’clock went along to Camp 1 to see the last hut in the Concentration Camp being burnt down. There was a large crowd there—the hut (No 47) was soaked in oil and in front of it was a large NAZI flag and also a flag with Hitler’s face painted upon it. Round the hut was a railing made up of white tape, on the left were two flame throwing Bren carriers, next to them was a Union Jack all neatly curled up at the top of the flag pole, and next to that a platform with microphone and loudspeakers.

Troops marched down and formed a guard behind the platform, then a section marched in front of the platform and drew up there—they were the Guard of Honour for the people who had died in Belsen Camp. The crowd then made a semi-circle round the hut and waited for whoever was going to perform the Ceremony. While we were waiting one of the flame-throwers accidentally sent a jet of flame over the hut—some of it dropping on the hut—amidst cheers from the crowd the crew of the Bren carrier dashed towards the hut and put out the flames with fire extinguishers.

Brigadier Glyn Hughes and three other Colonels Colonel Bird mounted the platform and made a short but good speech. He reviewed the history of Belsen Camp since the British liberated it on April the 15th and ended up by saying that ‘the British Flag did not stand for bestiality or cruelty and that was why the Union Jack had never flown over Belsen Camp—now as the last hut was being burned the Union Jack would fly for the first time’.

Brigadier Glyn Hughes and three other Colonels then got into the flame throwers and fired them, aiming at the Nazi flag and Hitler and as the hut burst into flames the Union Jack floated out from the top of the flag pole. Pure ceremony and melodrama but most impressive.

*M J Hargrave (Westminster).*

*From: A Diary of a Medical Student in Belsen Concentration Camp, May 1945.*

Dr Michael Hargrave, Shaw Farm, Wootton Bassett,
The Fiery End: 'Brigadier Hughes and three Colonels then got into the flame throwers and fired them ... as the hut burst into flame the Union Jack floated from the top of the flag-pole. Pure ceremony and melodrama but most impressive'. Photos: Major Prior


ACKNOWLEDGEMENT
I am indebted to Mr Clout, Librarian, IWM, for drawing my attention to this and other documents.

An Appreciation by the student's Civilian Medical Supervisor...

The first batch of London medical students arrived on the last day of April and the primary task allotted to them was the distribution of food for the starving. Until then the small number of British troops garrisoning the camp, which had been liberated on April 16, could do no more than deliver food from the cook-houses to the doors of the huts, where it was taken over by the internees. The result of such a method was that, in the moral collapse which prevailed in the camp, those who were able to walk took all the food they could get and became desperately ill from overfeeding, while those who were too weak to leave their huts died because there was no one to feed them.

Each student took responsibility for one or two huts, comprising from 100 to 150 patients, together with about twice that number of internees at least well enough to feed themselves. The students saw to it that the food was fairly distributed. The students also set up a dispensary and started medical treatment. The daily death rate among the sick, which had remained at about 4% until May 1st, fell in one week to half that figure and in the second week to half again, and at the same time a new spirit was plainly discernible among the internees.

One special body of 25 students created within the camp a hospital area in which the most sick could be cared for under hospital conditions, pending removal. They showed the same vigour in the business of cleaning filthy, verminous huts, creosoting the floors and dusting these with anti-louse powder, as others showed in the more strictly medical occupations. So excellent was their initiative that within two weeks 1200 patients had been washed, disinfected, reclothed and returned to the renovated huts, where they were cared for entirely by the students and by volunteer nurses from among the more active internees. There can be no doubt that the large majority of the patients in this students' hospital owe their lives to this achievement.

The students appreciated the help which they re-
received during their stay from the RAMC and the camp garrison, particularly from Lt Col J A D Johnson, the senior medical officer and Brigadier Glyn Hughes, DDMS, Second Army.

From: Dr A P Meiklejohn, Rockefeller Foundation Health Commission.
Seconded to the Nutrition Section, European Regional Office, UNRRA.

... and a Tribute by the Military Medical Commander

As the medical students from the London teaching hospitals are today leaving Belsen concentration camp I should like to take this opportunity of paying a tribute to the work that they have carried out during their stay. They arrived at a time when conditions in this horror camp were still indescribable; the first and only problem was the production of order and the supervision of feeding in the huts to save the lives of those that had to wait their turn and to ensure the speediest evacuation of those that could be saved.

The work of this type that they carried out is beyond praise and entirely by their initiative a hospital area was formed in the original camp in which the worst cases that had to wait to the last were nursed and undoubtedly saved.

Working too, under the worst possible conditions, individual supervision of all the other huts was carried out and treatment where possible commenced. Later when the whole camp had been evacuated, they were able to take full advantage of the wealth of clinical material available and to carry out work of an entirely medical nature. This they did with equal zeal and enthusiasm.

This experience, apart from its medical side, has I feel, given them a unique opportunity in that they were given the heaviest of responsibilities and their initial efforts depended entirely on their own initiative. One and all they threw themselves into the task with unbounded enthusiasm; they worked long hours in the worst possible conditions and never spared themselves.

The results speak for themselves and the fall in the death rate was, I am sure, largely due to their magnificent work. Thousands have cause to be grateful to them that their lives had been saved. The units of the RAMC in the Second Army are no less grateful for the help that was generously given.

From: Glyn Hughes, Brigadier, DDMS, Second Army.

EPILOGUE

At the invitation of 21st Army Group the Medical Research Council were able to send a team out to Europe at the end of April to study the possible value of hydrolysates in the treatment of starvation.

The team was extremely fortunate as it was given two orderlies for day duty and two for night duty. Fourteen thousand severely ill people had to be treated. It must be further remembered that the majority spoke Russian, Polish, Hungarian or Czech and it was therefore impossible for the medical staff to communicate with them in any way so as to reassure them. Patients who were brought into the ward when there was inevitably some apparatus about shouted "nicht crematorium". If a syringe was used to collect samples or an attempt made to set up an intravenous drip they again shrieked "nicht crematorium" and curled up shaking in bed. It had been the habit in the camp for the doctors to inject benzine or petrol when alive to induce a temporary paralysis so that they could be taken to the crematorium as dead.

Before discussing the scientific results of this study, I should like to pay a tribute to the help and encouragement the team received from all the RAMC personnel with whom it came in contact—particularly to Major General Phillips DMS 21st Army Group and Brigadier H L Glyn Hughes ADMS 2nd Army, and Lieut Col J A D Johnston, Commanding Medical Officer at Belsen.

The world has heard a great deal of the horror of Belsen—it has heard all too little of the gallantry of the handful of men and women, the staff of the field ambulance, a casualty clearing station, and a mobile laboratory, who had the courage to tackle one of the most terrible and immense medical problems that has ever risen.

Drs Janet Vaughan, C Dent and R Pit-Rivers.

The Students Roll of Honour

I have managed to trace the following names of the senior medical students who took part in the Belsen concentration camp Medical Rescue Operation—

a. Charter Cross: None. The Hospital and School had been evacuated to Ashridge, Herts.

d. London: T C Gibson, J Hancock, J H S Morgan, R D Pearce, P W G Tasker, J B Walker.
f. Royal Free: None.
g. St George’s: None.

It would be hugely interesting, intriguing enough, exciting even, to follow up the post graduate professional life of these awe-inspiring admirable devotees of Aesculapius. This is a herculean task for which—like the present state of the Tower of Pisa—I may have the inclination but not the time.

On the other hand you the Reader may find yourself able and willing to add a biographical or happier still an autobiographical paragraph or two to this remarkable and medically historic 'Student's Story'—40 Years After.