B.A.O.R. MEDICINE 1946-1949

BY
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In 1764 Sir John Pringle placed his clinical experience as Physician to the Forces in Flanders and Germany, during the years 1742-1745, on record (Pringle, 1764).

The diseases of the British Liberation Army (B.L.A.) in France and Flanders from July 1944 to July 1945 are described by Dr. E. Bulmer (Bulmer, 1945).

In July 1945 Dr. R. E. Tunbridge succeeded Dr. Bulmer as Consulting Physician. In March 1946, it was my good fortune to succeed to their very efficient organization. As a consequence, few Regular medical officers of the Army have enjoyed such opportunities for accurate diagnosis as were then available. This paper is an endeavour to place on record the diseases encountered, within our present knowledge and resources, in B.A.O.R. from 1946-1949.

The disease are those of the geographical area Schleswig-Holstein, Niedersachsen and North Rhine/Westphalia. That is the area of the old kingdoms of Westphalia and Hanover. The population at risk was in 1946 one million, with no married women or children: in 1949 100,000, of whom 25,000 were women and children. Babies were being born at an average rate of 150 a month.

As the population at risk changed in sex and age, in each succeeding year, numbers and percentages, quoted in the paper, apply to British Other Ranks only. Even here the population at risk was not the same during these four years. The soldier’s average age at the beginning of 1946 was 26-28 years. By the beginning of 1949, it was 19-21 years.

The general state of health remained good. There were no epidemics. There was no undue incidence of disease other than that of venereal disease, infective hepatitis, at first diphtheria and in the late summer and autumn of 1947 and 1948, a general increase of acute poliomyelitis.

The provision of hospital beds was 3 per 1,000. The holding policy in B.A.O.R. was sixty days. At no time during these years were more than 60 per cent of hospital beds occupied. Usually the occupied beds were under 50 per cent.
The diseases to be considered will be presented, in the main, in the form of the Annual Report on the Health of the Army (H.M. Stationery Office).

(1) Digestive Disorders

"The greatest impediment to messing are the wives and children, who must be maintained on the soldiers’ pay.”

In 1946 the incidence of digestive disorders was low. When acute perforation of an ulcer was not the cause of admission to hospital, for immediate operation, the patients were seen as out-patients by the medical specialist. 80 per cent of patients so seen were considered to suffer from functional dyspepsia, 20 per cent required admission to hospital for investigation by the examination of the stools for occult blood, the gastric acidity of a fractional test meal (gruel) and X-ray examination after a barium meal.

In the latter half of the year the final diagnosis in this 20 per cent were: dyspepsia 66, gastric ulcer 15, duodenal ulcer 94 and carcinoma of the stomach 7.

In the civilians aged 40-60 years, admitted to hospital with complications other than perforation of an ulcer, profuse haematemesis developed more often than melena.

The treatment of these patients was with blood transfusion and early feeding (Witts’ diet). Where the patient survived, this treatment shortened his period in hospital. Two young patients (under 25 years of age) where the lesion at post-mortem examination was found to be acute ulcer on the lesser curvature of the stomach, with erosion of an artery, were lost. The most useful leading article “The Bleeding Peptic Ulcer”—Lancet (1946)—assessed the difficulties in these cases very accurately.

During 1947 the incidence of digestive troubles remained low. The average age of the soldiers was younger. Where operative interference was not required the treatment was by Hurst’s or Witts’ diet. If the patient was in severe pain on admission to hospital, milk was given by a continuous gastric drip.

During 1948 the older men had been joined by their families and their homes were now in Germany. Where there was a history of recurring relapse in a gastric or duodenal ulcer patient, in this group, the Consulting Surgeon was asked to see the patient. The result of a recent fractional test meal (alcohol) was available at the consultation. In these selected cases partial gastrectomy gave most satisfactory results.

During the year admission with severe haemorrhage from gastric or duodenal ulcers continued to be treated with success with morphia, drip blood transfusion and early feeding (Meulengracht type).

During the first six months of 1949 the incidence of digestive disorders

1These are quotations from the previous accounts of disease by Sir John Pringle (1765).—(Ed.)
remained low. From July onwards the admission rate, in the areas where training and manoeuvres were held—the first since the end of World War II—rose steadily. The increase was present in both regular and National Service soldiers.

A sapper, aged 47, was admitted to hospital during the year with dyspnoea. He gave a history of anorexia and pain in the upper abdomen of three months' duration. He was pale and had lost 2 st. in weight. His ankles were swollen in the evening. On physical examination his liver was found to be enlarged 4 fingerbreadths. Death followed rapidly and at post-mortem examination an annular hard carcinoma of the pyloric end of the stomach was found.

(2) Cardiac Diseases

"Sequela of fevers; obstructions with resulting dropsy or jaundice."

During the period under review diphtheria having been widespread and virulent passed into devolution. This is well represented in Graph I.

During 1946 there were 25 deaths from cardiac failure due to diphtheria.

GRAPH I.

IncidencE of Diphtheria.—British Army, Other Ranks only.
Rate per 1,000 (quarterly).
By 1948 it had ceased to be found as a cause of cardiac death. A similar fall in incidence had occurred amongst the Germans in the British Zone. Up to November 3, 1948, 784 cases of diphtheria with 14 deaths were notified. Up to November 3, 1949, there were 660 cases, with 5 deaths (P.H. Adviser, 1949). From January 1, 1947, immunization against diphtheria after Schick testing, was increasingly used by the Army. It was also used by the Germans and had been available to them earlier. It is a clinical opinion that the severity of the illness had already waned, after a progressing incidence and virulence along the Rhine since 1930, when extensive immunization was introduced. As well as an immunized community, economic, political and social factors were tending to influence the incidence of the disease.

The second cause of damage to the heart was septicæmia due either to *Staphylococcus aureus* or *Streptococcus viridans*.

There were 11 admissions consequent upon coronary thrombosis and 20 as a result of hypertension with secondary heart failure. In three hypertensive cases polycystic disease of the kidneys was present. The value of investigating a hypertensive patient, under 40 years of age, without nephritis, by an intravenous pyelogram, was emphasized. One patient had polyserositis.

During the year two young soldiers (24 and 26 years old) died while playing football. Post-mortem examination in one case showed extensive atheroma in the coronary arteries; in the other an extensive atheromatous plaque was present in the anterior branch of the left coronary artery. In neither case was there an embolus or clot in the vessels.

In 1947 diphtheria continued to cause cardiac death. But its incidence decreased during the last three months of the year. Rheumatic fever then appeared as a clinical condition. Septicæmia (*Staphylococcus aureus*) with involvement of the heart was still encountered.

In the few cases of hypertension encountered amongst the soldiers X-ray examination after an intravenous pyelogram on one occasion showed unilateral hydronephrosis. The kidney was excised. The subsequent fall in blood pressure had been maintained when the patient was examined six months later. Coronary thrombosis occurred in two soldiers with recovery.

These latter conditions were not so benign in middle-aged officers and members of the C.C.G. Amongst these there were 14 admissions for coronary thrombosis and 26 due to hypertension with secondary heart failure.

There were 3 deaths amongst the admissions for coronary thrombosis. One of these (M., 56 years) appeared to have lived for forty-eight hours after rupture of his left ventricle. At post-mortem examination a rupture of the apex of the left ventricle was found. There was more than a pint of blood in the pericardium. A second case (M., 53 years) had a leak of blood into his pericardium. He survived his acute illness in chronic cardial failure. Routine X-ray examination of the chest in a male, aged 28 years, showed very extensive calcification of the pericardium. He was free from symptoms and returned to duty. He was kept under observation. Within
six months, without complaint on his part, it was found that the liver was increasing in size and to direct reading, his venous pressure was increased to 19 cm. Without symptoms, he had developed Pick's syndrome. One case each of giant-celled arteritis and polyarteritis nodosa were seen.

Families were now established with the B.A.O.R. and several cases of congenital heart disease were seen in children.

During 1948 acute disease of the heart was less in evidence. When it occurred it was due to rheumatic fever or subacute bacterial endocarditis. The older officers and members of the C.C.G. continued to be admitted with coronary thrombosis and hypertension with heart failure.

A most unusual case was a member of the C.C.G. (F., 39 years), who threw a stick for her dog to fetch, while walking. She had immediate severe retrosternal pain and fainted. During convalescence she had a diastolic murmur over her aortic area. It is probable that she had ruptured an aortic cusp.

During 1949 cardiac conditions encountered were relatively numerous and varied. There were 6 deaths in soldiers, 5 being sudden and out of hospital. There was no diphtheria, little rheumatic fever and two cases of myocardial infection, thought to be due to a virus, gave a negative Hirst test in their blood serum.

Post-mortem examination of the 5 cases that died out of hospital gave the following results:

(a) M., 24 years. Rupture of posterior wall of left ventricle. No history of trauma or previous ill-health obtained from his comrades.

(b) M., 28 years. Coronary thrombosis.—Anterior branch of left coronary artery.

(c) M., 33 years. Atheroma-coronary arteries. No thrombus demonstrated.

(d) M., 35 years. Coronary thrombosis.

(e) M., 42 years. Coronary thrombosis.

In addition 3 officers and 2 members of the C.C.G. died as a result of coronary thrombosis during the year.

An unusual feature were three women with coronary thrombosis, one of whom died.

3 National Service soldiers were found to have old-established endocardial lesions, of presumed rheumatic origin. A member of the C.C.G. (M., 36 years), died in chronic heart failure. Post-mortem examination showed extensive old-standing rheumatic lesions of his aortic and mitral valves.

A most interesting feature of the years under review has been the low incidence of disordered action of the heart in the soldiers.

The patients formed three groups:

(a) Soldiers, aged 19–40 years.

(b) Officers and Civilians, aged 40–60 years.

(c) Children during 1948 and 1949.
The conditions in which heart muscle failure was encountered could be grouped:

(a) Acute

- Rheumatic fever.
- Septicaemia.
- Virus infection.
- Beri-beri condition of stout drinkers.

(b) Subacute

- Rheumatic fever.
- Septicaemia.
- Hypertension.
- Coronary disease.

(c) Chronic

- Rheumatic fever (valvular disease).
- Hypertension.
- Coronary disease.
- Constrictive pericarditis.

(3) Rheumatic Fever

"1743 — Rheumatic pains with or without fever.
1744 — Flanders: rheumatism with fever.
1745 — Less rheumatic fever."

In this group we were not one whit more erudite than Sir John Pringle. With the older age-group in 1946, there was very little rheumatic fever. A more frequent disability encountered was a febrile infective polyarthritis with a raised blood sedimentation rate. The condition frequently persisted for two or three months without presenting the full picture of Reiter's syndrome.

By 1947 the age of the soldier was younger and there was a universal low incidence of rheumatic fever, except in Berlin. The incomplete Reiter's syndrome continued at the same percentage incidence.

The younger age of the soldier continued in 1948 when there was a steady low incidence of rheumatic fever generally, except in Berlin. One soldier (19 years) was ill for less than a week before his death, with acute rheumatic pericarditis. Cases of incomplete Reiter's syndrome continued. During 1949 the incidence of rheumatic fever and incomplete Reiter's syndrome continued unchanged. An airman (21 years) was ill with acute rheumatic pericarditis during the year. He fortunately responded rapidly to treatment with salicylates.

During these years the number of cases of acute gonococcal arthritis varied from 2 to 6 cases a year.

(4) Staphylococcal Fever

Ryle has given a very complete description of this condition (Ryle, 1948). The cases seen in B.A.O.R. were frequently lacking in physical signs and
diagnosis was difficult. When a history of boils or a pustular skin infection, about six weeks previously, could be obtained or recent scars were found on physical examination, the condition could be suspected with a reasonable degree of assurance.

In their absence and with:
(a) negative blood cultures,
(b) an absence of leucocytosis,
in 40 per cent of cases a leucopenia to 4,000 white cells per c.mm.
and the differential white cell count showing a diminution in polymorphonuclear cells with a relative increase in lymphocytes;
(c) blood sedimentation rate (Westergren): 6–20 mm. one hour,
(d) no response to intramuscular penicillin, 1–2 million units.

The consultant found it difficult to maintain that the case was probably one of septicemia with pus formation.

Occasionally after six to eight weeks' illness scanty red blood cells would be found on microscopic examination of the centrifuged deposit of the urine. Eventually evidence of abscess formation would be obtained in those subacute cases.

The site of the abscess was frequently in a vertebral body. These cases were complicated by signs of pressure on the cord due to collapse of the vertebral body on formation of an epidural abscess. Other sites selected were the lungs, peri-renal tissues; in deep muscle planes, subphrenic, prostate, brain and on three occasions a solitary abscess of the liver was found. In two patients, at post-mortem examination, in the third patient the condition was suspected and he recovered after operation.

(5) Intestinal Infections

Intestinal worms, bacillary dysentery and typhoid fever are all shrewdly discussed. Dysentery is not a disease of civil life. "Astringents are not necessary and should not be used."

During 1946 the incidence of bowel disorders in a country, where towns and sanitary installations had been destroyed by war, remained surprisingly low:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shigella flexneri</td>
<td>30</td>
</tr>
<tr>
<td>Shigella sonnei</td>
<td>4</td>
</tr>
<tr>
<td>Clostridium botulinum</td>
<td>1</td>
</tr>
</tbody>
</table>

Ten cases of infection with Entamoeba histolytica required treatment in hospital. There was no suggestion that any of these patients had been infected in Germany.

The admissions during 1947 were:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shigella shiga</td>
<td>1</td>
</tr>
<tr>
<td>Shigella flexneri</td>
<td>8</td>
</tr>
<tr>
<td>Shigella sonnei</td>
<td>5</td>
</tr>
</tbody>
</table>
There were 4 admissions with *E. histolytica* infections. Two of these infections appear to have been acquired in Germany. 7 patients were treated for amoebic hepatitis.

In 1948 an early dry spring was followed by a wet summer and autumn, with little fly breeding. The admissions to hospital were:

- *Shigella flexneri*: 1
- *Shigella sonnei*: 11

There were 8 admissions for *E. histolytica* infections.

There was an outbreak of food poisoning in one unit due to *Salmonella typhi muriun*. There were a total of 22 admissions due to this infection. The unit Cook Corporal was found to be a faecal carrier of *S. typhi muriun*. With his removal from the cookhouse the outbreak stopped.

The outbreak was a mild one. The symptoms were fever and headache lasting from two to four days, with abdominal pain and nausea.

The summer of 1949 was also wet, with few flies. There were 3 admissions for bacillary dysentery:

- *Shigella flexneri*: 2
- *Shigella newcastle*: 1

There were 2 admissions for *E. histolytica* infection.

During these years the admissions for typhoid group fevers remained very low amongst the soldiers. Their relative incidence was much higher amongst airmen and German-born wives. *Salmonella typhosum* and *paratyphosum B.*, were the organisms isolated from these cases.

The intestinal worms encountered were *Ascaris lumbricoides*, *Tænia solium*, *Tænia saginata*, *Enterobius vermicularis* and *Trichuris trichiura*. These were not common and it was unusual to find *Ascaris lumbricoides* at post-mortem examination.

By 1948 a considerable number of the children were infected with *Enterobius vermicularis*. This was due to the German use of human excreta to manure vegetables and ground fruit.

(6) **Malaria**

1748 May: Spring cases of malaria.

"Uncommon proportion of intermittents which were not all new cases."

Sir John Pringle was much concerned with malaria. During the years reviewed here it was not a medical problem. In 1946 indigenous malaria was recognised in East Friesland and the adjacent coast of Schleswig-Holstein, north of the Elbe. The vectors are *Anopheles maculipennis* and its subspecies *atroparvus* and *messieae*.

Most of the malarial infections seen in B.A.O.R were relapses during infection with *Plasmodium vivax* which had been acquired in either Africa or Asia. During 1946, six fresh *P. vivax* infections were accepted, as originating in B.A.O.R.: during 1947 one case.
During 1946 there were 38 admissions for relapses of *P. vivax* infections, in 1947 25 admissions, in 1948 13 admissions and in 1949 1 admission. In addition in 1947, 2 relapses were notified as being due to *Plasmodium falciparum* and a further 2 in 1948.

The treatment used in malarial relapse cases was quinine Bihydrochlor. grains 10, with Pamaquin grammes 0·01, three times a day for ten days.

(7) JAUNDICE

1743 December. Belgium.

"Jaundice without fever."

"A disease of dry ground."

During the period under review, this infection was in evolution. Two factors favoured the viruses involved. An early return to the treatment of syphilis with intravenous arsenic, promoted "passage" of the virus of homologous serum jaundice.

Progressive lowering of the 1938 standards of filtration and clarification of water, before chlorination, had continued to augment the probability that viruses passed out of the body in excreta, would gain access and survive in drinking water. This has favoured the survival, dispersal and "passage" of the virus of infective hepatitis.

The incidence of infective hepatitis in the B.A.O.R. is shown in Graph 2.

The probability is that from 1946–48, the virus of homologous serum jaundice may have caused from 60–20 per cent of these cases of jaundice. After 1947 its incidence was under 10 per cent.

In the period 1947–49 the virus of infective hepatitis caused 80–90 per cent of the cases of jaundice. The clinical course of the illness also changed during this period and became more fatal for people in middle age, 40–60 years. This was in keeping with the observations of Dr. M. Jersild in Denmark (Jersild, 1947).

During 1946 there were 1,771 admissions to hospital with jaundice; in 1947, 996 admissions with 15 deaths; 1948, 599 admissions with 2 deaths; 1949, 455 admissions with 7 deaths. 4 of these deaths were in middle-aged members of the G.C.G.

Figures notified in the German civil population for infective hepatitis from January 1 to October 15 in 1948 were 3,367, deaths 28; in 1949, 4,378, deaths 68.

(P.H.A. to H.C. (BZ), November 3, 1949.)


(8) LEPTOSPIROSIS

Illness due to the following leptospiræ was recognized during these years: *L. icterohaemorrhagiae, canicola, grippo-typhosa*.

As the diagnosis and grouping of the condition is dependent on serological
investigation, in the average case, the presenting clinical picture is recorded in each group.

*L. icterohaemorrhagiae.* (Host: Rat.)

Fever; haemorrhagic herpes; calf muscle tenderness; nephritis; meningism; atypical pneumonia. Investigation: Albuminuria; microscopic red blood cells, granular casts; raised blood urea. C.S.F.: increased lymphocytes; raised urea percentage. Blood: polymorphonuclear leucocytosis.

*L. canicola.* (Host: Dog.)

Fever; conjunctivitis; meningism; pain, abdominal or muscular. Investigation: Albuminuria; microscopic red blood cells. C.S.F.: increased lymphocytes; urea percentage normal. Blood: usually a polymorphonuclear increase, blood urea increase dependent on renal discharge.

*L. Grippotyphosa.* (Host: Vole (*Microtus arvalis*).)

History of exposure in a swamp or mud.

Fever; conjunctivitis; meningism. Investigation: occasionally albuminuria with microscopic red blood cells.

Infections with *L. icterohaemorrhagiae* were admitted to hospital from Hamburg and Schleswig-Holstein. *L. canicola* from Hamburg and Hanover: *L. grippo-typhosa* from Helmstedt and Osnabruck. (P.H.A. to H.C. (BZ), 1949.)

During 1946–49 there have been several publications and discussions on these infections (Baber and Stuart, 1946; Minkenhoff, 1948; MacKay Dick and Watts, 1949; Gsell, 1949; *Proc. Roy. Soc. Med.*, 1949).

*(To be continued)*