

Renkioi: A Forgotten Crimean War Hospital and its Significance

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Summary

Renkioi Civil Hospital was built late in the Crimean War (1854-6) in Turkey on the Dardanelles. Designed by Isambard Kingdom Brunel, its prefabricated structure was a brilliant engineering innovation. As a civil hospital for military patients, it was staffed by experienced civilian doctors, thereby relieving the shortage of military doctors.

Renkioi is remembered as an astonishing early prefabricated structure. However the war was soon to end and it was never used to near capacity. Thus, its other successful features are largely forgotten. It demonstrated the advantages of a doctor, rather than a military officer, being in complete command of a hospital and this was later accepted by the army. Renkioi also showed how infection could be reduced by able staff in a well administered, properly designed hospital with good sanitation. After the war, Dr Edmund Parkes, its Medical Superintendent, became the first Professor of Hygiene at the new Army Medical School, ensuring that "the prevention of disease and the promotion of health" became the first function of the Army Medical Services.

Résumé

L'hôpital civil d'Erenkoy a été construit en Turquie, dans les Dardanelles, peu avant la fin de la guerre de Crimée (1854-1856). Sa structure préfabriquée marqua les mémoires. Cette brillante innovation technique (la première du genre) fut l'oeuvre d'Isambard Kingdom Brunel. Comme il s'agissait d'un hôpital civil destiné aux patients militaires, on y plaça des médecins civils, dotés d'une bonne expérience et capables de remédier au manque de médecins militaires.

Pourtant, la guerre touchant à son terme, les ressources de l'hôpital ne furent jamais pleinement utilisées et on oublia vite les autres qualités de cette institution qui méritent pourtant d'être rappelées. C'était un médecin et non pas un officier militaire qui dirigeait l'hôpital - un indéniable avantage que l'armée finit par reconnaître. Erenkoy apporta ainsi la preuve qu'un personnel compétent, travaillant dans un hôpital bien conçu, judicieusement administré et respectant les règles d'hygiène était à même de lutter efficacement contre les infections. Après la guerre, le docteur Edmund Parkes, fort de son expérience acquise en qualité de responsable médical d'Erenkoy, fut tout désigné pour devenir le premier professeur d'hygiène de la nouvelle Ecole médicale de l'Armée. A Erenkoy furent ainsi instituées «la prévention des maladies et la promotion de la santé» deux fonctions premières des services médicaux de l'Armée.

Renkioi Hospital, existing during the second half of the Crimean War (1854-56), is now almost completely forgotten save in one respect. It was the work of Isambard Kingdom Brunel, the great Victorian engineer. He designed it as one of the first large prefabricated buildings and arranged its transport and erection in Turkey, an extraordinary and rapidly completed engineering feat. Over the course of eight months, 23 ships carried 1,500 tons of hospital parts to be erected on the shores of the Dardanelles, near the town now known as Canakkale: the first ships arrived on May 8th 1855.

The civil hospital had skilled experienced civilian staff but military patients. It was first proposed in the darkest days of the war, January 1855¹², to relieve the strains on the army medical services exposed by the disasters at Scutari. It was made up of huts, each a ward for 50 patients, and could be extended indefinitely, eventually becoming large enough to take 1500 patients.

With its skilled medical staff, it was seen as additional to, or replacing a base hospital. Such intentions were appropriate in January 1855, but by the time the hospital opened, beds for convalescence were the greatest need. Far from the Crimea and never fully accepted by the army medical services, it remained underused. In all 1408 patients were admitted, with 642 the largest number in hospital at any one time. Only as the Redan fell and the

siege of Sevastopol was over did the hospital become fully operational. Fighting died away that autumn and the war ended before the hospital could take its place as an important military hospital of the campaigns³.

The Report⁴ by Dr Edmund Parkes, the Medical Superintendent, which included a supplement by Brunel, comprehensively covered the medical aspects of the hospital, but most subsequent accounts have concentrated on the engineering and architectural achievements⁵⁸. The "Wooden Hospital" was the third large prefabricated scheme to be undertaken and was entirely built of wood, unlike the glass and iron of the previous giant prefabricated constructions, the Great Exhibition of 1851 and Paddington Station, opened in 1854. It was an industrial building, prepared off-site in England and then assembled after a journey of 3000 miles. In 1861, after the start of the American Civil War, Florence Nightingale was asked for help by the American Government to which she responded⁹. Details of Renkioi must have been sent, for prefabrication as a building method in hospitals was used by both sides¹⁰, and since then prefabrication has become a common building practice. This was to be Renkioi's most important legacy. However, there were other successful innovations of medical and military significance which deserve attention.

After the war, a Royal Commission¹² studied the disaster caused by disease rather than by battlefield casualties. It was a meticulous investigation, under the chairmanship of Sidney Herbert, Secretary of State for War, which owed a great debt to Florence Nightingale and those associated with her for its pertinence and its important consequences. Concerning the "civil element", only Renkioi received much attention and the verdict there went no further than the evidence presented by Sir John Hall, Inspector General of Hospitals, the most senior medical officer at the "seat of war". It was his responsibility to direct patients to Renkioi, but in all other ways the hospital was independent and Dr Parkes, reporting to the War Office, bore the whole responsibility for it. Hall's evidence was confined to his adverse view of the value of Renkioi. He thought the Civil Hospitals very expensive and that Renkioi was built too late, when upwards of 3000 empty beds were available elsewhere, and that it was too far from the Crimea. Hall was strongly averse to the civil hospitals but this summary is not unfair¹².

From the military viewpoint, Renkioi was adjudged a failure and, with the war over, little further reference to it was made. Yet Renkioi must have been freely discussed at the Commission, which was made up of influential people¹³ and it had lessons for those who listened. The War Office, with Sidney Herbert, the Minister and, in particular, Benjamin Hawes, the Under Secretary, (Brunei's brother-in-law), knew every detail of the hospital. The Report of the Commission ends with a note from Andrew Smith, Director-General of the Army Medical Department, dissenting from the Commission's conclusions over three matters, one of which was the command of a military hospital. Smith preferred the arrangement which had been uniquely demonstrated at Renkioi, of a doctor in complete charge. The Renkioi arrangement was accepted by the army much later and the command of a hospital passed completely to a medical officer.^M

Renkioi demonstrated, by its example, the advantages of an up-to-date, properly designed, well administered hospital. At that time, permanent military hospitals on British soil were little better than Scutari, though not under the same duress. The excellence of Renkioi Hospital, which had been visited by Stafford and Sutherland, both members of the Commission, contrasted with the nuisances at the permanent army hospital at Fort Pitt, Chatham. These had been very adversely reported upon by Andrew Smith in 1843, but were unchanged at the time of the Commission. Acceptance of that standard had resulted in catastrophe at Scutari.

Renkioi's worth was also well-known to another member of the Commission, Sir James Clark, who had played a major part in commissioning the hospital.

Florence Nightingale, not herself a member of the Commission, though submitting written evidence, never visited the hospital but referred to those "magnificent huts" at Renkioi¹⁵. Five Renkioi huts were diverted to Scutari and this must have allowed her to make her comment first hand. The many witnesses at the Commission, among them Parkes himself, who had the ear of the medical profession, had ample opportunity to discuss Renkioi amongst themselves. At Renkioi medical staffing was organised as in a civil hospital and difficulties which junior doctors experienced in military hospitals, under the orders of seniors whose duties were administrative and who had ceased to have direct care of patients, did not arise. Visible reminders of Renkioi were the patent siphoning water closets which had been shipped back from Renkioi and which were soon installed in the new military hospital at Netley¹⁶.

Intended as a temporary hospital only, Renkioi Hospital was purpose built. By contrast, the general hospitals in the Crimea, the base hospitals at Scutari and the Civil Hospital at Smyrna, relied on old, converted buildings, often augmented by tents or later huts; these were smaller than those at Renkioi. Overcrowding was frequent and sanitary conditions appalling. As the war continued, conditions in these hospitals, at first so bad, improved greatly and death rates, when Renkioi and Scutari were simultaneously open at the end of the war, would have been about the same and low¹⁷, had not patients with cholera been admitted to Scutari. It is quite wrong to compare, as has been done more than once, the very high death rate during the first winter of the war at Scutari, with that at Renkioi at the end of the war.

Even in comparison with civil hospitals, Renkioi possessed advantages. One hundred and fifty-four civilian hospitals and dispensaries had been founded in England, Scotland, Wales and Ireland between 1700 and 1825 and in many the buildings had, by the time of the Crimean War, been in use for at least fifty years¹⁸. A thorough survey of British civilian hospitals, undertaken in 1860-63¹⁹, emphasized the value of ventilation - especially ventilation - drainage, cleanliness and space, much as Brunei had done. Many hospitals were considered satisfactory, especially in London, but a number of provincial and rural hospitals, particularly those with water supply from wells, water closets at the corner of a ward and cesspits, fell short of the standards set at Renkioi. At Renkioi, the only ward design features called into question were the absence of a lobby outside the water closets, (made less necessary by their modern design), the desirability of increasing ventilation by making use of the roof ridges, (an improvement introduced in the larger huts of the American Civil War hospitals), and beds arranged in two

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rows, not four. The system of forced ventilation which Brunei installed was however never used or needed in Turkey.

Brunei's buildings represented the best practice of the time and Parkes found them entirely satisfactory. Though intended to be temporary, Renkioi was a modern hospital representing a big advance in design. Brunei's guiding principle was to ensure the comfort of the soldier patients. He showed an extraordinary grasp of the situation, knowing that the burden of sickness far exceeded that of caring for the wounded. It is not known from which medical authorities he sought advice²⁰, though he was in close touch with Dr Parkes. Brunei's brother-in-law Benjamin Hawes, as Under Secretary of State for War, had access to every sort of official information. Brunei's proposals were in accord with the views that Florence Nightingale expressed in her book, "Notes on Hospitals", which was, however, not published until after the war. He knew the importance of diarrhoeal diseases and his provision of water closets of the latest design was a striking example of his foresight.

The three great groups of illness during the campaign were diarrhoeal diseases, cholera, (so specific as to be classified separately), and fever, with scurvy always in the background. Diarrhoea was a universal scourge and diarrhoeal diseases caused the highest overall mortality even without cholera, a terrifying diarrhoeal disease which was regarded as 'the most fatal disease known in the annals of medicine'. To deal with all these circumstances Brunei had insisted upon a good water supply, effective sanitation, ventilation, proper cooking facilities, and warmth and shelter in clean surroundings but, unfortunately, meeting some of these strict requirements also determined the site of the hospital. An ideal site could only be found, not on the Bosphorus as had been hoped, but far from the battlefield, at best 72 hours from the Crimea, so that the military effectiveness of the hospital was reduced.

The buildings at Renkioi were set out on a pavilion plan, with single storey buildings separated by ample space, the plan which was soon to become the favoured disposition of hospital buildings. At that time, only the Royal Naval Hospital at Plymouth, (1764-65) had been built on this plan, which allowed the free passage of air past buildings and encouraged their ventilation, circumventing the miasmatic or primarily atmospheric spread of disease, then considered the most likely manner of spread of many diseases. Renkioi preceded the next British hospital built on the pavilion plan, the Blackburn Infirmary (1858). The water supply, completely uncontaminated and allowing up 30 gallons (136 litres) per head each day, was brought by earthenware pipes from springs high in the hills²¹. Taps and

running water and a little hot water available in the wards meant that the staff could wash their hands easily, patients could wash or be washed, while efficient laundries ensured clean linen. Soyer stoves were installed in the kitchens and kitchen practice was transformed by a liberal water supply. Renkioi was the first overseas military hospital to have modern sanitation with siphoning water closets, the same principle used today. On disembarkation, patients were carried on horse-drawn trolleys on a rail track to the wards, obviating all the difficulties experienced elsewhere.

The hospital had a very capable medical staff and was well administered. These favourable circumstances must have had a significant effect upon infection, making its contraction in hospital less likely and hastening recovery. The Times reported that "there has been no epidemic, no spreading of disease from bed to bed, no case of indigenous disease"²². The most common illnesses were fevers and it was apparent that few of the hospital staff caught infectious diseases (in comparison, for instance, with the staff at Smyrna²³). Among the staff, there were three cases of typhus, a doctor, a nurse and an orderly; the orderly died. Without knowing of its transmission by lice, Parkes recommended that patients with typhus should be isolated²⁴ and, that on steamers with typhus about, knapsacks should be separated from their owners. Isolation had a value, but more effective must have been the baths for patient in the ward, together with the drying cabinet in the laundry reaching 400° F, for clothing often swarming with lice. Diarrhoeal diseases were common; Brunei sent instructions to be displayed by the water closets, (which were often unfamiliar to their users), to forbid rubbish being thrown down them, a common occurrence elsewhere. Discipline, despite Renkioi being a civil hospital, was good and these instructions would have been obeyed. Hall, on his way back to England in July 1856, noted that all but two of the patent WC.s at Scutari, installed on the instructions of the Sanitary Commission, were out of order²⁶. In the previous November, an epidemic of cholera had occurred at Scutari among troops stationed in the east wing of the hospital buildings and the outbreak was attributed to cholera in nearby villages: 138 died including several of the hospital staff. The cause of cholera was as yet unknown, though the possibility that the disease could be waterborne was beginning to be considered. At Scutari, the water supply was considered satisfactory. There was never cholera at Renkioi, but had there been, in view of the excellent sanitary arrangements, would the staff there have escaped infection?

Only one death was due to wounds and surgical patients accounted for rather less than one quarter of all patients at Renkioi. Spencer Wells, Senior Surgeon and later a pioneer of abdominal surgery, was very concerned

with cleanliness and the spread of disease^{27,28}. Erysipelas and pyaemia, easily recognised complicating features of wound infection, were unusual and treated by isolation; this practice was not always followed elsewhere.

Besides moving towards cleaner, if not aseptic surgery, Wells used bulldog clips at Renkioi to control haemorrhage; from these he later developed the Spencer Wells forceps, still in use today²⁹.

Renkioi has two other reasons for being remembered, one conjectural, the other undoubted. The first concerns cremation, just coming to the fore in Britain because of scandals arising from the lack of space for burials in increasingly overcrowded cities. Dr Parkes, commenting on the giant burial grounds close to Renkioi, on returning to England, put forward the merits of cremation as a method of saving space in great cities³⁰. Spencer Wells, the Senior Surgeon, later President of the Royal College of Surgeons of England, became one of cremation's greatest advocates. William Eassie, Assistant Engineer at Renkioi went further, later becoming the first Secretary to the Cremation Society. These three influential men were only too aware of shallow Turkish graves, hasty burials on the battlefield, and the common sight of dead horses and cattle left by their owners at the roadside. Though this can only be conjecture, the idea of cremation on a greater scale may have come from their proximity to Troy and their awareness of the burning of the dead in the Ancient World. The hospital itself was perceived as close to Troy though the exact site of Troy was yet to be established³¹.

Renkioi has one further reason to be remembered, in its undoubted influence on the subsequent career of Dr Parkes, its Medical Superintendent. Parkes, exceptionally gifted, was, early in his career, an army medical officer in India and Burma. On leaving the army, he soon became Professor of Clinical Medicine at University College Hospital, London. Renkioi gave him the opportunity to create an enormous hospital overseas, to exercise administrative skills, and to learn something of the wider world of government, all of which fitted him for his next move. After the war the Royal Commission recommended the establishment of an Army Medical School and in Dr Parkes was found the ideal first Professor of Hygiene. He went on to become a world authority on hygiene and his career at the School ensured that, "the prevention of disease and the promotion of health" became the first function of the Army Medical Services³², the most fundamental change in their history. After Parkes' death in 1876, Florence Nightingale was to say of him, when referring to his work at the Army Medical School, that 'he was the mainspring of that watch'³³.

The story of Renkioi is one of enterprise and excellence; had the early horrors never lessened and the

war continued, Renkioi, instead of being forgotten, would have been an outstanding success. Macleod, a Civil Surgeon though not at Renkioi, wrote, "I have no hesitation, in saying, it is a very great loss to the advancement of surgery, that this war has so soon come to a close"³⁴. The same could have been said about Renkioi.

Acknowledgement

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References and Notes

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- 3 The number of admissions to Renkioi compared to those at Scutari was very small. The estimate for Scutari, which Florence Nightingale gave to the Royal Commission 1858, was 29,000 admissions with 4,600 dead, while the official figures quoted in the Medical and Surgical History of the Crimean War were 43,288 and 5432.
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- 11 *Report of the Commissioners appointed to enquire into the Regulations affecting the Sanitary Condition of the Army, the Organization of Military Hospitals and the Treatment of the Sick and Wounded*. London: Stationary Office, 1858.
- 12 Hall would have liked the hospital to have been sited at Sinope on the southern shore of the Black Sea. This site was rejected by Parkes.
- 13 Rt. Hon. Sydney Herbert (Chairman), Augustus Stafford MR Andrew Smith, (Director General. Army Medical

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- Department), Thomas Alexander, (a serving medical officer who followed Andrew Smith as Director General but died soon after taking office), Sir John McNeill, (Surgeon in India, Diplomat, Chairman of the Supplies Commission. 1855), Sir Thomas Phillips, (Lawyer), James Ranald Martin, (Inspector General of Army Hospitals), Sir James Clark, (Physician), John Sutherland, (Leader of the Sanitary Commission 1855) and Dr Graham Balfour, (Secretary).
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 - 17 If deaths due to cholera at Scutari during this period are put aside, the percentage of deaths from all causes at Scutari falls to 2.5%, lower than at Renkioi (3.2%).
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 - 20 Letter, IK Brunei to B Hawes, 22 Feb 1855. University of Bristol Library. Brunei Collection, Letters, Book 12, p. 121.
 - 21 Hall considered this supply was very expensive. When the enlargement of the Monastery Hospital in the Crimea was proposed, he suggested a fountain in the precincts and a well, already both existing, as the only supplies needed (Observations on the Report of the Sanitary Commissioners in the Crimea over the years 1855 and 1856 by Sir John Hall. M.D. KCB. London. Clowes).
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 - 31 The village now known as Pinabarci was considered the most likely site of Ancient Troy when Renkioi was open. When the hospital was due to close, John Brunton the Engineer, took his work force to Hisarlik, 12 miles (19 km) from the hospital, and had them dig there for perhaps only a day. This almost fortuitous excavation was the first made at the site which Schliemann later established as that of Troy.
 - 32 *Editorial*. Journal of the Royal Army Medical Corps 1976; 122: 172
 - 33 Letter to Dr Acland 17.3.1876 quoted by Zachary Cope. *Florence Nightingale and the Doctors* 1958, page 82
 - 34 Macleod GHB. *Notes on the surgery of war*. Edinburgh Med J **1856; 1:984**

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Fig. 1 : Map. Black Sea. Sea of Marmara and Dardanelles

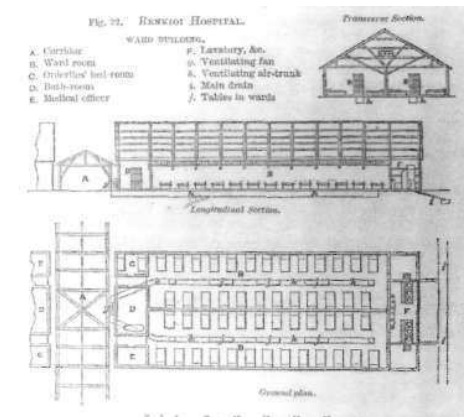


Fig. 2 : Plan of Ward Hut [From: Brunel I. The Life of Isambard Kingdom Brunel. London: Longmans Green, 1870]

Fig.3 : Map. Renkioi Hospital. Three rows of ward huts (each similar to that shown in Figure 2) appear as they would have if the hospital had been completed. Also shown is the pipe bringing water 21 1/2 miles (4km) from springs high in the hills and ending at the reservoir, and the railway, also never completed, running between the two landing piers. [Acknowledgement] Courtesy of the Wellcome Institute Library. London.



Fig.4 : Renkioi Hospital in 1855. Beyond the hospital are the Dardanelles and, faintly visible in the distance, the Gallipoli Peninsula. This view was taken by Dr John Kirk, later knighted, who was to accompany David Livingstone, as naturalist and physician, and ultimately to be responsible for securing an end to the slave trade in Zanzibar. [Acknowledgement] By permission of the owner and courtesy of the Scottish National Portrait Gallery, Edinburgh.