

## The “Matchbox on a Muffin”: The Design of Hospitals in the Early NHS

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Although I am not myself a devotee of bigness for bigness sake, I would rather be kept alive in the efficient if cold altruism of a large hospital than expire in a gush of warm sympathy in a small one.<sup>1</sup>

The role of architecture within Britain’s National Health Service has received little attention beyond the discussion of technical matters. Yet architectural design is not a neutral, value-free resource from which architects draw as desired. The layout, design and styling of buildings can manifest the geographically- and temporally-localized thinking, aspirations and prejudices of their designers and clients. This was especially so during the early years of the NHS when, in the late-1950s and early-1960s, significant capital expenditure was once again channelled towards major healthcare schemes. And, since this state funding was largely directed towards general hospital schemes, architects were forced to re-engage with hospital design after a gap of almost two decades, to update inter-war thinking with contemporary continental European and North American ideas.

This article seeks to trace the conflation of clinical, social and architectural ideas which justified, in the early post-war period, the development of a particularly influential architectural solution for the modern hospital: the ward tower set on a wider, lower block of accommodation. Whilst not the only possible solution to the architectural needs of the modern hospital, this model—known as the “matchbox on a muffin”<sup>2</sup>—was certainly the most influential during the early years of the NHS, and underwrote schemes both on tight inner-city sites and more expansive greenfield locations. This article reconsiders the development of this model, and marshals two case studies to provide accounts of the ways in which architects came to terms with the changing demands of the modern hospital in the late 1950s. What emerges is the desire to provide hospital architecture with a symbolic form expressive of the modernity of the healthcare to be found within. Moreover, the reactions to these buildings highlight the extent to which such designs could equally be aligned by critics with a crude Taylorist functionalism. Far from being a neutral statement of

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I should like to acknowledge the assistance of the late Stuart Gray, William Howitt and staff at Guy’s and St Thomas’ Hospitals in the production of this article. Figures 2, 16, 17, and

<sup>1</sup> Aneurin Bevan, MP, Minister of Health, in Commons debate on the NHS Bill, 30 April 1946.

<sup>2</sup> It is possible that the originator of the term was Richard (later Lord) Llewelyn-Davies.

clinical and architectural modernity, the “matchbox on a muffin” offered a solution which can be understood only in relation to a series of key aesthetic and programmatic assumptions.

### Hospital Building in the New NHS

The most remarkable feature of the new NHS hospital service’s capital allocation during the 1950s was its insignificance. Compared to the £430m and £57m capital expenditure allocated in 1954 to housing and schools respectively, the £10m for hospital investment was insignificant,<sup>3</sup> only one-third of its pre-war level.<sup>4</sup> That the hospital building stock was in need of improvement was not in doubt: of the 2,800 hospitals (and 500,000 beds) inherited by the NHS in 1948, 45 per cent had been built before 1891, and 21 per cent before 1861—many being former Poor Law workhouse infirmaries. Across the country the Ministry of Health found “a similar pattern of deficiencies, outmoded physical facilities, maldistribution and uneven quality of services, shortage of nursing and medical staff, inadequate training, idiosyncrasy and lack of co-ordination, and inadequate funding, owing to either poverty or neglect.”<sup>5</sup>

Of course the hospital authorities’ attention had been diverted by the administrative upheavals of nationalization, and the task of recommissioning 35,000 unstaffed beds (approximately 70 medium-sized hospitals) to cope with the demand unleashed by nationalization.<sup>6</sup> Yet by the mid-1950s the lack of new hospital schemes presented cause for public concern; as the *Daily Telegraph* noted in 1955, “The 14 new towns now rising in Britain have houses, churches, factories, schools, shops, cinemas, inns, but not a hospital between them.”<sup>7</sup> The problem seemed to lie in the enormous cost of the NHS itself, a cost which early on regularly (and spectacularly) outstripped official estimates. Prompted by attacks on the outlay on the NHS, the government introduced charges for dentures and spectacles (and subsequently prescriptions) in May 1951. Clearly, restraining capital expenditure offered a far easier and apparently politically neutral source of savings.

By 1953, the fear of NHS spending spiralling out of control brought the appointment by the Minister of Health, Iain Macleod, of a Committee of Enquiry into the Cost of the NHS (the Guillebaud Committee). By re-estimating and deflating NHS expenditure to obtain the *real* cost of the service, the Committee’s 1956 report not only gave the NHS a clean bill of health,<sup>8</sup> but also recommended a seven-year programme of capital investment of £30m per annum.<sup>9</sup> The recommendations went

<sup>3</sup> J O F Davies, ‘The general design problems of the hospital from the medical point of view’, *RIBA Journal*, October 1954, pp. 499–503.

<sup>4</sup> Ministry of Health, *Report of the Committee of Enquiry into the Cost of the National Health Service*, London, HMSO, 1956, Cmd. 9663, para. 64.

<sup>5</sup> Charles Webster, *The health services since the war*, vol. 1, *Problems of health care, the NHS before 1957*, London, HMSO, 1988, p. 261.

<sup>6</sup> Peter Stone, ‘Hospitals: the heroic years’, *Architects’ Journal*, 15 December 1976, pp. 1121–48.

<sup>7</sup> J Pringle, ‘Crisis in hospitals’, *Daily Telegraph*, 9 February 1955; quoted in Webster, *op. cit.*, note 5 above, p. 341.

<sup>8</sup> Ministry of Health, *op. cit.*, note 4 above, para. 23.

<sup>9</sup> *Ibid.*, paras. 59–65, 213.

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unheeded, and throughout the 1950s official proclamations of increased capital expenditure disguised a little-changed situation. The meagre funding of additional psychiatric facilities in 1954/5 (the “mental million”) was followed by the February 1955 (unrealized) declaration of a stepping-up of the hospital building programme, to £20m in 1958/9, and £31m in 1961/2<sup>10</sup>—albeit initially only £2m more than the 1954/5 austerity funding. However, the Ministry did earmark money for major building schemes costing over £250,000, thereby benefiting the teaching hospitals, which side-stepped Ministry parsimony by drawing upon jealously-guarded endowment funds.<sup>11</sup> Meanwhile, ministers pointed to the commencement of general hospital projects at Hensingham (near Whitehaven), Swindon, Crawley, Harlow, Truro, Huddersfield, Swansea, Coventry and Wythenshawe,<sup>12</sup> and later at Northwick Park, Hull and Barking.<sup>13</sup> Yet by 1959, the Minister of Health, Derek Walker-Smith, could announce the completion of only six projects in England and Wales,<sup>14</sup> of which only the first phase of the Princess Margaret Hospital, Swindon, was part of a general hospital scheme. Scotland’s health services (under a different cabinet minister) fared slightly better, with developments at Edinburgh’s Western General Hospital, Kirkcaldy’s Victoria Hospital and the new Bellshill Maternity Hospital. So did Northern Ireland, whose Altnagelvin Hospital by architects Yorke Rosenberg & Mardall was, in 1960, possibly the first major post-war hospital development to be completed in the United Kingdom. And so, in 1959, a BMA-sponsored report into hospital building could still condemn the nineteenth-century conditions in which twentieth-century medicine was largely being delivered and demand a ten-year, £750m rebuilding programme.<sup>15</sup> Indeed, it was not until 1961, with Enoch Powell’s appointment as Minister of Health, that the foundations were to be laid for the 1962 *Hospital plan*,<sup>16</sup> a publication that finally marked government commitment to a significant programme of hospital investment.

For those projects which did proceed the problems were not simply financial: low NHS pay scales made architectural employment unattractive compared with private practice, whilst the private firms which consequently gained almost all the early major commissions lacked up-to-date design guidance. Indeed, at a 1954 Royal Institute of British Architects (RIBA) conference on hospital design, one commentator remarked, “With a few notable exceptions, the architect delegates seemed to feel that they were not qualified to express opinions and had clearly come to the conference to listen rather than to talk.”<sup>17</sup>

<sup>10</sup> ‘Hospitals: new programme’, *Architects’ Journal*, 7 July 1955, p. 8.

<sup>11</sup> Webster, *op. cit.*, note 5 above, p. 344.

<sup>12</sup> *Op. cit.*, note 10 above.

<sup>13</sup> ‘Hospital building progress’, *Architect and Building News*, 31 December 1958, p. 860.

<sup>14</sup> ‘New hospitals: minister gives news’, *Architect and Building News*, 11 November 1959, p. 423.

<sup>15</sup> A L Abel and W Lewin, ‘Report on hospital building’, *Br. med. J.* (Supplement), 4 April 1959, pp. 109–14.

<sup>16</sup> See, for example, Charles Webster, *The health services since the war: vol. 2, Government and health care, the National Health Service 1958–1979*, London, HMSO, 1996. See also, Charles Webster, *The National Health Service: a political history*, Oxford University Press, 1998; Ministry of Health, *A hospital plan for England and Wales*, (Cmnd 1604), London, HMSO, 1962.

<sup>17</sup> ‘The architect and the doctor’, *Official Architecture and Planning*, November 1954, p. 521.

### Inter-war Development of Hospital Design

With the late start to hospital building after the War, British hospital design had effectively stagnated for two decades, given that those hospitals built under the war-time Emergency Hospitals Service (EHS) had typically been makeshift single-storey hutted complexes. By contrast, the inter-war period had witnessed a varied output—from modest cottage hospitals to monumental urban hospital centres, across both the voluntary (private) and local authority (public) sectors. It had also been a period of fundamental change in hospital design, as modernist architectural thinking offered new stylistic freedoms to the architect. At the same time, hospitals were growing in size and complexity, distributing the cost of expensive new diagnostic and therapeutic equipment over an expanding complement of beds and outpatient clinics, all of which increasingly rendered medical architecture a specialist activity. This professionalization of hospital design was bolstered by the growing perception of the hospital as an effective *machine à soigner* rather than some sordid hostel where impotent quacks simply presided over the lingering demise of their bedfast patients. The *Architects' Journal* stated the case bluntly in 1932: "Hospitals house sick people . . . Every sick person costs 8s. or 9s. per day, is earning nothing, and is a burden on the community. Hospitals exist to put them right and turn them into the world as economically as possible."<sup>18</sup> Clearly, the journal envisaged hospital *architects* facilitating this clinical process through efficient, modern hospital design. And it was inpatients who were the first to witness the greatest changes as hospitals reconfigured their wards in response to changing medical and social pressures.

Popularized by Florence Nightingale, the open ward of about thirty beds arranged up and down an open room became a standard ward layout of the late nineteenth-century (Figure 1).<sup>19</sup> Inpatient hospital care had traditionally been reserved for the less fortunate in society, as recipients of charity or relief under the Poor Law, and there was little incentive for the authorities to cosset their charges (a situation often unchanged by the introduction of the voluntary hospitals' own contributory health insurance schemes). The design of these wards was part predicated on the miasmatic conception of infection, which attributed disease to the noxious emanations and smelly air thought to fester in ward rooms. The dissipation of these vapours was, therefore, crucial, necessitating high ceilinged wards cross-ventilated by windows on each side (Figure 2), and arranged as a series of pavilions open to the sun and air.

The advantages of the plan were not simply medical, for such a ward could easily be supervised by a small nursing staff. For more extrovert patients the design possibly fostered a spirit of camaraderie, whilst the constant distractions alleviated the boredom of a protracted stay in bed (indeed, such noisiness could shield personal conversations with clinicians). None the less, the open ward generally presented a

<sup>18</sup> 'Hospital specialization', *Architects' Journal*, 16 November 1932, p. 605.

<sup>19</sup> See, for example, G Goldin and J D Thompson, *The hospital: a social and architectural history*, London, Yale University Press, 1975; Jeremy Taylor, *Hospital and asylum architecture in England 1840–1914: building for health care*,

London, Mansell, 1991; also Adrian Forty, 'The modern hospital in England and France: the social and medical uses of architecture', in Anthony King (ed.), *Buildings and society: essays on the social development of the built environment*, London, Routledge & Kegan Paul, 1980, pp. 61–93.



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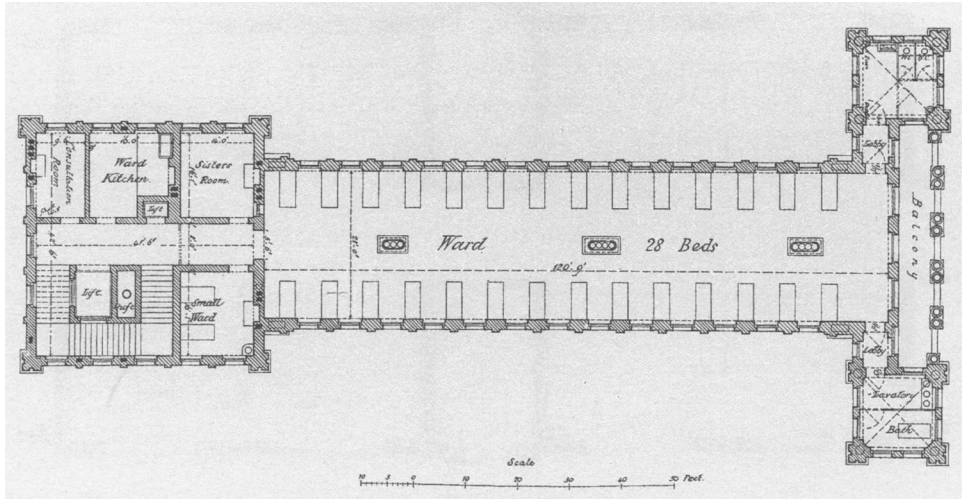


Figure 1: Plan of a typical Nightingale open ward, late nineteenth-century.



Figure 2: Guy's Hospital, London, open ward, not dated (early twentieth-century). Courtesy of King's College London.

lack of privacy, especially for seriously ill patients, for whom only one or two single side-rooms might be provided. Furthermore, with few sanitary or day facilities, patients had little relief from the bedpan round and the ward environment. Nor did

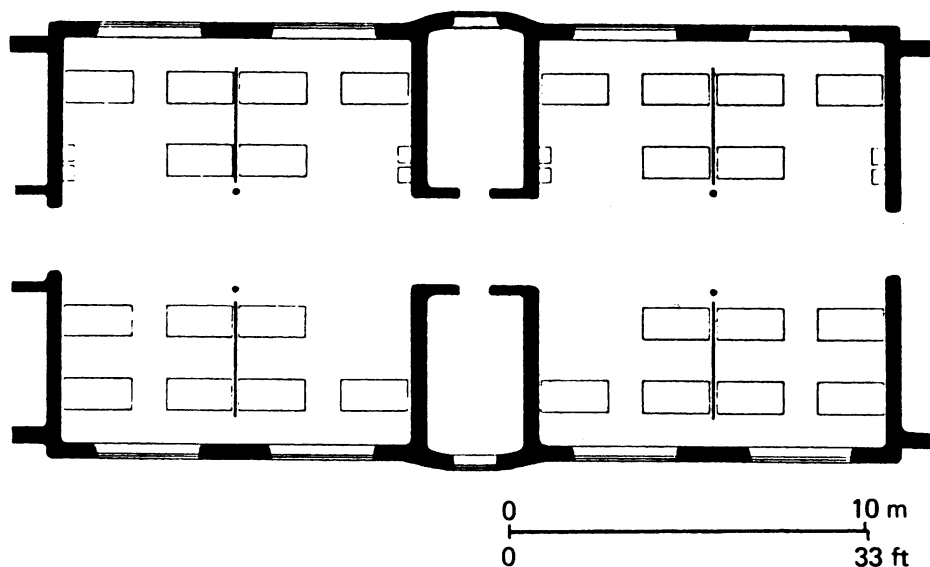


Figure 3: Plan of Rigshospital Ward (c.1910).

the open ward facilitate the flexible allocation of beds between sexes; a half-empty male ward would stay that way whilst an adjacent female one might be over-crowded. Finally, the Nightingale ward presented architectural problems; its high ceilings generally militated against buildings taller than three or four storeys, whilst the space required between adjacent ward blocks (to ensure the adequate penetration of sunlight and fresh air) grew in proportion to their height.<sup>20</sup>

For wealthier patients, the inter-war years witnessed the consolidation of the hospital's position as the site of expert clinical treatment. The increasing efficacy of surgical techniques, building on nineteenth-century advances in anaesthetics and asepsis,<sup>21</sup> rendered hospitalization not only more effective, but also more attractive to those whose care had traditionally been effected at home. Able to provide the aseptic operating conditions necessary for modern surgery, voluntary hospitals could now generate income by offering fee-paying middle-class patients single rooms in newly-built annexes.

For the less fortunate, a major reappraisal of inpatient accommodation was also underway in Britain by 1930, prompting the subdivision of the wards of both local authority and voluntary hospitals into smaller sections and placing beds parallel rather than perpendicular to the walls. Prototypes for such a layout could be found both in America and in the 1910 ward layout of the Rigshospital, Copenhagen (Figure 3)—a design apparently first employed in Britain in Percy Adams' 1929 design for Southend Hospital. If Adams—a principal of architects Adams Holden

<sup>20</sup> 'Hospital planning and development', *Lancet*, 1937, i: 225–8.

<sup>21</sup> For an account, see John Woodward, *To do the sick no harm: a study of the British voluntary hospital system to 1875*, London, Routledge & Kegan Paul, 1974.

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& Pearson—had been converted, others remained unconvinced: the practice's Birmingham Hospital Centre design was rejected for its unconventional wards. None the less, Adams incorporated the Rigshospital layout into his prototypical Miniature Hospital for the King Edward's Hospital Fund for London of 1933. Intended as propaganda for the voluntary hospital sector, this 1/16th-full-size model typified progressive design trends, with its solaria and smaller twelve-bed Rigshospital-style wards subdivided with part-glazed screens.<sup>22</sup> Compartmentalization (achieved either via subdivided open wards or smaller purpose-built bedrooms) was increasingly accepted by hospital architects during the 1930s in numerous—though not all—projects, as at Elcock & Sutcliffe's Hertford County Hospital (1932–4) and Burnet Tait & Lorne's Royal Masonic Hospital (1931–3). Indeed by the 1940s the open ward could be declared by some to be out-of-date,<sup>23</sup> and the victory of the subdivided ward complete.<sup>24</sup>

The abandonment of the miasmatic theory of infection was an essential factor underwriting these changes. Medical understanding of bacteriology and germ theory had rid epidemiology of its reliance on theories of noxious odours, and emphasized anti-septic and subsequently aseptic procedures rather than cross-ventilation in the battle against bacterial contagion. In response, during the 1930s, designers began to specify hard non-absorbent internal surfaces and smaller bed bays with privacy screens to counter and localize infection. The uncontrolled Nightingale ward flow of air was now thought simply to cross-infect surrounding patients. As the *Architects' Journal* noted in 1937:

The pavilion style, so characteristic of English hospital planning during the past sixty years or so was based on the theory of the aerial convection of infection. This is now recognised as a fallacy, and the effect on hospital design is becoming apparent already. Hospitals will be more compact, and will not necessarily be restricted in height; and the saving in money, time, and energy is certain to be considerable. Isolation hospitals are now things of the past. The pavilion system may be retained in tuberculosis sanatoria, but even this is neither necessary or certain.<sup>25</sup>

Yet, the role of sunlight and fresh air was far from discounted. Most notably, sunlight was shown to have direct therapeutic and anti-bactericidal properties; whilst in the treatment of tuberculosis and rickets light treatment became valued during the 1930s. As the Royal Institute of British Architects' 1933 report, *The orientation of buildings*, noted:

During the last few years an extraordinary and even revolutionary change has taken place in all countries in the general application, both by the medical profession and by the general public, of the values of fresh air and light, particularly sunshine. The treatment of some diseases by exposure of the skin to the action of light, natural or artificial, has in a marvellously

<sup>22</sup> *The King's Fund miniature hospital*, London, King Edward's Hospital Fund for London, 1934.

<sup>23</sup> 'Review of equipment and materials: the hospital ward', *Architect and Building News*, 28 June 1940, pp. 256–7.

<sup>24</sup> J Murray Easton and S E T Cusdin, 'Recent

trends in hospital design', *Architect and Building News*, 27 June 1947, pp. 254–8.

<sup>25</sup> A G Ogilvie, 'Today and tomorrow: the medical view', *Architects' Journal*, 24 June 1937, pp. 1094–8, on p. 1098.

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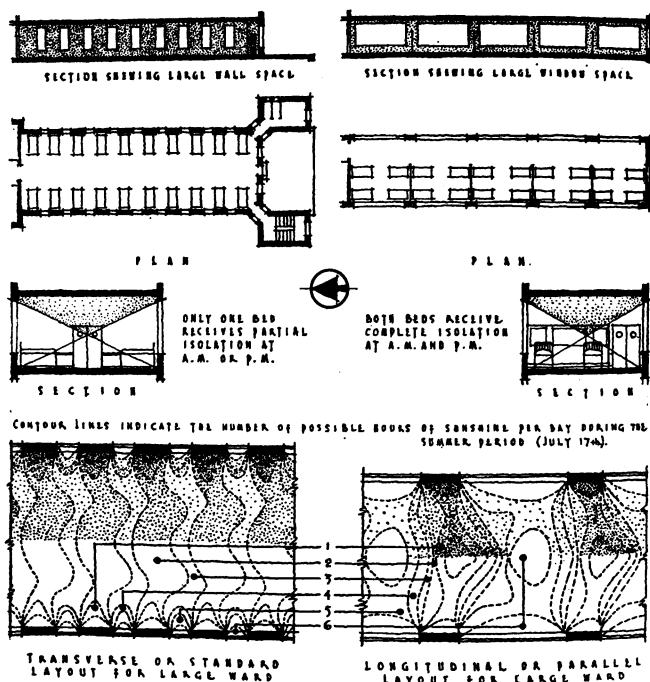


Figure 4: Comparison of ward designs and patient insolation from the Royal Institute of British Architects, Joint Committee on the Orientation of Buildings, *The orientation of buildings*, London, RIBA, 1933. From Ronald Ward, *The design and equipment of hospitals*, London, Baillière Tindall & Cox, 1949.

short space of time leaped from the obscure position of a somewhat contemptuously neglected specific to the status of one of the most valued and even invaluable weapons in the medical armoury.<sup>26</sup>

The report dismissed the Nightingale ward as clinically inefficient, since its envelope was typically 60 per cent wall and allowed little direct light to fall on the patient's body. By contrast, the Rigshospital layout, with its wide picture windows (and only 34 per cent solid wall), demonstrably increased both the quantity and the efficacy of patient insolation (Figure 4). Lionel Pearson's 1932 article 'Light and air in the modern hospital'<sup>27</sup> had already established the principle, and was reiterated in the *Architects' Journal's* 1937 hospitals issue.<sup>28</sup> Hospital design could now offer medicine "an overwhelming improvement in efficiency"<sup>29</sup> and modernist architecture, in particular, exploited constructional technology to provide both the necessary structural

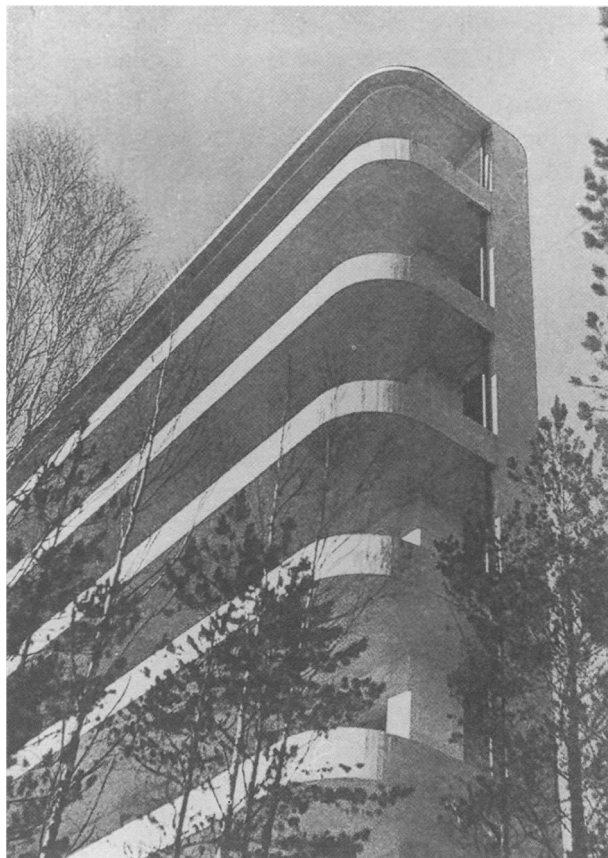
<sup>26</sup> RIBA Joint Committee on the Orientation of Buildings, *The orientation of buildings*, London, RIBA, 1933, p. 3.

<sup>27</sup> Lionel Pearson, 'Light and air in the modern hospital', *Architects' Journal*, 16 November 1932, pp. 609–19.

<sup>28</sup> Ogilvie, op. cit., note 25 above.

<sup>29</sup> RIBA Joint Committee, op. cit., note 26 above, p. 14.

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*Figure 5: Paimio Sanatorium, Finland, by Alvar Aalto, 1929–33. From *Architects' Journal*, 16 November 1932.*

forms and the appropriate connotative allusions—its cantilevered balconies like cruise liner decks; its simple, whitewashed geometric forms evocative of order and hygiene. Drawing on such continental European precedents as Alvar Aalto's Paimio Sanatorium (1928–33, Figure 5) and Bijvoet & Duiker's Zonestraal Sanatorium (1928), progressive British designers offered schemes which challenged established approaches to the architectural styling of the hospital. One of the most notable accomplishments of the new vanguard was Pite Son & Fairweather's Sully Hospital, a tuberculosis sanatorium near Cardiff (1931–7), in which an expansive, low-rise plan was elaborated with cubic white blocks and balconied terraces lined with stretches of glazing. Yet, it was not sufficient to provide an architectural illusion of efficiency, for there was still much to be done within the building. Most notably, clean and dirty procedures could be more systematically separated within wards, whilst the treatment of patients could be removed altogether from bed areas. These developments were to await the end of the War and the researches into hospital design marshalled by the Nuffield Provincial Hospitals Trust.

## The Nuffield Provincial Hospitals Trust and The Development of Hospital Design

The Nuffield Provincial Hospitals Trust (NPHT) was but one of Lord Nuffield's charitable bodies established in advance of the 1943 Nuffield Foundation.<sup>30</sup> Formerly William Richard Morris (1877–1963), Lord Nuffield had made his fortune from motor manufacturing (Morris Motors) and subsequently dispensed large amounts of it to charity. Medical causes were major beneficiaries—variously attributed to his unfulfilled desire to be a surgeon, his hypochondria, and the need to ensure the good health of his workforce (local hospitals being recipients). Founded in December 1939 with one million shares in Morris Motors, the official purpose of the NPHT was “the co-ordination on a regional basis of hospital and ancillary medical services throughout the Provinces”.<sup>31</sup> Created partly to prevent the breakdown of hospital services which the War was expected to entail, it was but one of numerous variously-motivated inter-war attempts to integrate the ill-coordinated collection of private, public and charitable healthcare facilities and insurance systems.<sup>32</sup> Yet it was not until the establishment of the state-controlled Emergency Hospital Service (EHS) with the outbreak of war that a comprehensive hospital organization based on the eleven Civil Defence regions forced co-operation between the various parties.<sup>33</sup>

The EHS's geographical pattern of organization—reworked to provide a teaching hospital in each region—was to form the basis of the NPHT's 1941 proposal for a re-organized post-war health service.<sup>34</sup> Indeed, the NPHT subsequently undertook several hospital surveys with the Ministry of Health, highlighting the country's inadequate healthcare facilities and staffing.<sup>35</sup> The creation of the National Health Service signalled the realization of the NPHT's original *raison d'être* and it promptly realigned itself towards research into various medical fields and, from 1949, health centre and hospital design, initially under John Madge and then architect Richard (later Lord) Llewelyn-Davies (assisted by John Weeks, later Llewelyn-Davies's business partner).

A series of studies, reports and building projects followed, including health centre schemes at Harlow (1952) and Corby (1954), a Geriatric Day Hospital at Oxford (1958), a small hospital project at Mignot Memorial Hospital, Alderney (1960), as

<sup>30</sup> For a general history of the NPHT see Gordon McLachlan, *A history of the Nuffield Provincial Hospitals Trust 1940–1990*, London, Nuffield Provincial Hospitals Trust, c.1992.

<sup>31</sup> NPHT, *A report on the activities of the Trust 1939–1948*, Oxford University Press, 1949, p. 9.

<sup>32</sup> For example, the Ministry of Health Consultative Council on Medical and Allied Services, 1920 (the Dawson Report), the 1937 report of the Voluntary Hospitals Commissions for the British Hospitals Association (the Sankey Report), the Planning and Economic Policy Group's 1937 *Report on the British health services*, and the BMA's 1938 report, *A general medical service for the nation*.

<sup>33</sup> The Emergency Hospital Service (1939–45) built over 100 hospitals including several 600-bed and one 1,000-bed hutted hospitals.

<sup>34</sup> NPHT, *A national hospital service: a memorandum on the co-ordination of hospital services*, Oxford, NPHT, 1941.

<sup>35</sup> For example, Ministry of Health, *Hospital survey: the hospital services of London and the surrounding area*, London, HMSO, 1945. For a recent history, see Martin Powell, *Evaluating the National Health Service*, Buckingham, Open University Press, 1997.

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well as influential reports into laboratories (1961) and children's hospitals (1963).<sup>36</sup> The Trust's outstanding contribution (undertaken with the University of Bristol) was its *Investigation into the functions and design of hospitals*, published in 1955.<sup>37</sup> The multi-disciplinary team availed itself of the latest international design guidance, questionnaires, time and motion studies and research to reconsider hospital design from first principles, ranging over nursing routine, medical technique, architectural design and their financial implications.<sup>38</sup> Whilst addressing the whole hospital, it was the research into ward design which had the most immediate and enduring impact. Consolidating the trend away from the Nightingale ward plan and dismissing the miasmatic theory of infection, the team argued instead for the sub-division of the ward to combat bacterial cross-infection. Statistics suggested that 10 per cent of inpatients acquired an infection whilst in hospital, and that the problem was getting worse as strains of staphylococcus were growing increasingly resistant to antibiotics.<sup>39</sup> The architect could control neither the source nor the recipient of the infection, but could affect the clinical environment by sub-dividing wards, providing segregated treatment areas for dressing wounds, and installing air-conditioning to prevent the spread of bacterially contaminated air. Equally, the proposals increased patient privacy and thereby enabled the allocation of beds between sexes and clinical specialities within the ward, fostering a more flexible, and managerially more efficient, utilization of beds albeit, notably, at the expense of nursing ease of patient supervision.

The Nuffield studies emphasized the early ambulation of patients, a régime which had been found during the Second World War to speed recovery, cut inpatient stay by up to half, and increase the throughput of cases (estimated in 1951 to be 10–20 per cent higher).<sup>40</sup> Of those not bedfast it was estimated that most would require toilets, whilst half would need a day space—amenities often lacking from the Nightingale plan.<sup>41</sup> Furthermore, the team suggested that medical need necessitated four single rooms per sixteen beds—considerably more than previously estimated.<sup>42</sup> A further constraint on the ward layout was imposed by the need to economize on scarce NHS nursing staff; time and motion studies were employed to measure the

<sup>36</sup> Nuffield Foundation: Division for Architectural Studies, *The design of research laboratories*, London, Oxford University Press, 1961; and, *idem*, *Children in hospitals: studies in planning*, London, Oxford University Press, 1963. The Division took over the NPHT's architecture-related research between 1954 and 1960, again under Llewelyn-Davies.

<sup>37</sup> NPHT, *Studies in the function and design of hospitals*, London, Oxford University Press, 1955.

<sup>38</sup> The team included a physician, nurse, field-work organizer, historian, accountant and architect, assisted by 39 time-study engineers, architects and research assistants.

<sup>39</sup> In 1945 10 per cent of staphylococcus was resistant to antibiotic, by 1960 it was 90 per cent (T Somerville, 'The control of hospital infection', *Architects' Journal*, 7 July 1960, pp. 9–11).

<sup>40</sup> Early ambulation was first expounded for abdominal surgery in 1899 by Emil Ries in the

*Journal of the American Medical Association*, where he noted the "obvious" economic benefits to the US public of \$1bn from the early return of patients to work. Subsequently, in the 1940s, US surgeon Daniel Leithauser reported that early ambulation halved inpatient stay (J W D Goodall, 'Early ambulation: a survey of hospital practice', *Lancet*, 1951, i: 43–6; also Daniel Leithauser, *Early ambulation and related procedures in surgical management*, Springfield, Ill., Charles C Thomas, 1946, esp. pp. 217–19).

<sup>41</sup> Goodall, *op. cit.*, note 40 above.

<sup>42</sup> J W D Goodall, 'Single rooms in hospital: estimate of the medical need', *Lancet*, 1951, i: 1063–5. Four single rooms per sixteen beds would be sufficient to meet 82 per cent of medical need (i.e., infective cases, infectable cases, the dying/seriously ill, "nuisance cases" (owing to their medical condition), and special attention cases).

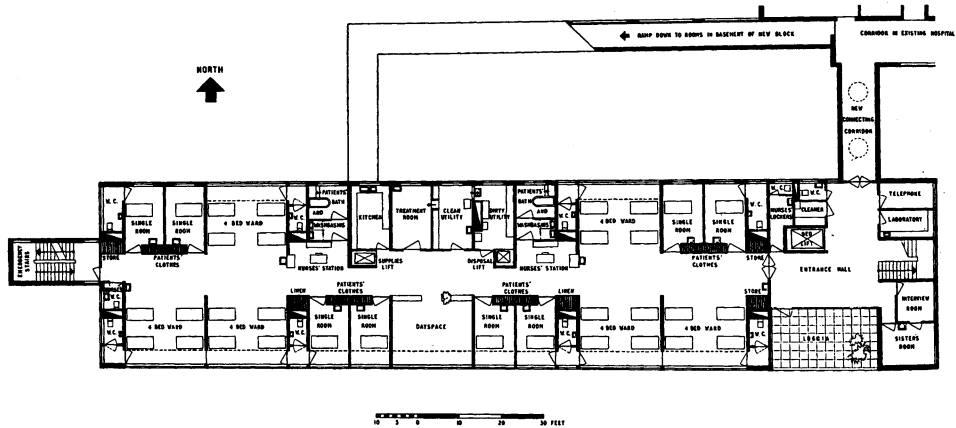


Figure 6: Larkfield Hospital, Greenock, Nuffield Provincial Hospitals Trust (Richard Llewelyn-Davies, John Weeks, *et al.*), 1951–6. Plan of ward. From Nuffield Provincial Hospitals Trust, *Studies in function and design of hospitals*, London, Oxford University Press, 1955. Courtesy of Oxford University Press and John Weeks.

distances walked by nurses and suggested that their time could better be utilized in a more compact ward layout than the Nightingale plan. The task faced by the Nuffield team, then, was to design a ward which could accommodate an increasing number of sanitary, day and ancillary rooms, as well as sub-divided bed bays to minimize cross-infection within a more compact layout, and still be capable of efficient patient supervision.

The Nuffield programme saw the completion of two experimental ward blocks at Larkfield Hospital, Greenock (1951–6) (Figure 6) and Musgrave Park, Belfast (1956–9). The Larkfield design provided two 32-bed wards in a two-storey block attached to the main hospital. The wards were split into two units of sixteen beds, each with its own nurses' base and shared service rooms between. Following the team's proposals, the design incorporated smaller, four-bed bays, additional WCs and single rooms, a separate treatment room and a patients' day room. This plan formed the basis of the later forty-bed Musgrave Park unit, with patients divided between two nurses' bases.

The team still aimed for the natural illumination of the ward, although by 1954 it was felt that "From the purely medical viewpoint there are very few conditions for which sunshine is specifically needed".<sup>43</sup> Indeed, the post-war treatment of such diseases as tuberculosis with streptomycin (rather than light therapy or surgery) and the diminishing length of inpatient stay (partly due to early ambulation) were all contributing to lessen the therapeutic necessity of sunlight. For architects, convenience of planning was now the overriding design consideration, and so balconies, solariums and other such features were rapidly to disappear from post-war hospital architecture.

The Nuffield studies remained the only British source of modern hospital design

<sup>43</sup> Davies, *op. cit.*, note 3 above.



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throughout the 1950s, bolstered by Nuffield-run hospital design conferences at the Royal Institute of British Architects in 1954 and 1958, and a stream of Nuffield publications. Other sources included Ronald Ward's 1949 *Design and equipment of hospitals*, and the 1947 American text *Hospitals: integrated design* by Isadore Rosenfield; each provided alternative guidance but lacked the immediacy and authority of the Nuffield work. The involvement of the Ministry of Health in hospital design was both late and low key; the Ministry's first *Hospital building bulletin* on operating theatres was not published until 1957,<sup>44</sup> and it appeared to the architectural profession that the Ministry was "trying desperately to recoup an impossible situation".<sup>45</sup> Indeed, only in 1959 did the Ministry gain a formal "Architect's Branch" under William Tatton Brown (modelled on the influential Ministry of Education school design pattern<sup>46</sup>), and only in 1961 did publication begin of the *Hospital building notes*, offering guidance on individual departmental design, just as the hospital building programme was finally being substantially enlarged under Enoch Powell's 1962 *Hospital plan*.<sup>47</sup> In the meantime, the Ministry relied on the Nuffield work, for example collaborating in 1960 on hospital design courses at the RIBA and Worcester College, Oxford. With a growing number of major projects under consideration, architects also needed to consider the architectural form of the whole hospital, and it was the tower block which first offered a form for the modern hospital—its employment not only giving designers a means of obtaining much-heralded operational economies, but also the opportunity of endowing the hospital with a symbolic architectural modernity.

#### **The "Matchbox on a Muffin"**

The overt display of architectural modernity was a seductive lure for many post-war hospital designers; how better to express the modernity of the medical care to be found inside than through the employment of a legibly modern architectural form? If medical science was a progressive, modern discipline (with an ever-widening range of treatments and therapies), architecture too had a growing range of modern technologies and styles at hand. That the hospital should simultaneously serve and utilize the two seemed, to many architects, both logical and imperative.

The first major post-war hospital projects took place against the backdrop of the final years of the Macmillan administration and the consumer and property booms reordering life in Britain's cities. If, at times, the reorganization of Britain's social infrastructure occurred almost by stealth, the same could not be said of the reconstruction of the nation's cities. New motorways and ring-roads were creating fast, modern transportation networks, which architects furnished with modernist office and housing blocks indicative of a country belatedly modernizing its physical environment. The office tower block enjoyed special prestige, both as the site of an

<sup>44</sup> Ministry of Health, *Operating theatre suites (Hospital building bulletin 1)*, London, HMSO, 1957.

<sup>45</sup> 'Hospital programme', *Architects' Journal*, 21 July 1960, p. 91.

<sup>46</sup> See Andrew Saint, *Towards a social architecture: the role of school-building in post-war England*, London, Yale University Press, 1987.

<sup>47</sup> For a further discussion see Webster's publications, op. cit., note 16 above.



*Figure 7:* Lever House, New York, Skidmore Owings & Merrill, 1952.

essentially modern form of work, and also through the “machine-age” aesthetic deployed in its design. Office work was white-collar, respectable and clean, all the more easily elided with the image of a modern, democratic economy than the manufacturing and heavy industry so central to Britain’s nineteenth-century economy. Nor was there much hesitation in adopting the paradigm of post-war office block design demonstrated by New York’s Lever House of 1952 (by Skidmore Owings & Merrill (SOM), Figure 7) where a simple tower of office accommodation rose from a similarly geometric plinth of ancillary accommodation, the latter’s horizontality maintaining the street line and offering a counterpoint to the slender verticality of the tower. Britain first gained its own version of Lever House in 1959: Castrol House (on the Marylebone Road, London) by Gollins Melvin & Ward (GMW) was a pared down imitation, yet it was rapidly to be replicated across the country. Indeed, GMW had a high reputation for modern office architecture, and a 1956 *Architectural Review* critique of their work suggested approvingly (and revealingly),

It is efficient, and it comes from an office that has set itself to be efficient, commercial and modern ... it can only be a matter of years before [buildings like Lever House] become commonplace. For they are not difficult to design—they are the product of a system of exact thinking and meticulous detailing ... we should hail the appearance of the first completely

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anonymous piece of machine architecture to appear in London this century ... it is not pretending to be a palace, or a temple, or even to be a work of great architecture.<sup>48</sup>

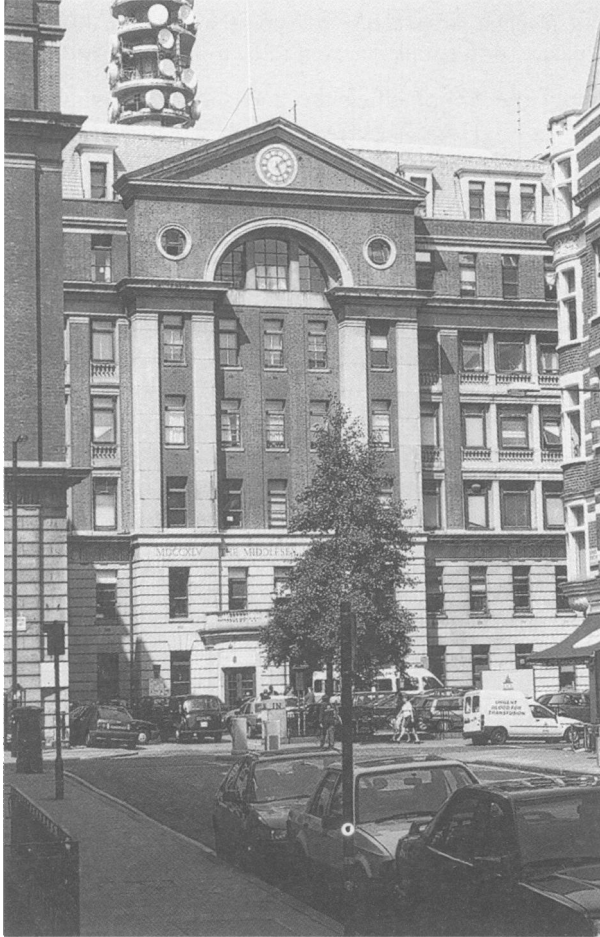
It was not simply the air of efficiency and modernity suggested by the sleek, shining surfaces of Lever House's glazed walling which were of note; the building also dramatized the split between repetitive, speculative office areas and fixed, irregular ancillary areas through their separation into an upper office tower slab above a lower podium of service and support accommodation. Other modernist (and non-modernist) architects had already effected similar manoeuvres, yet here the statement was redressed in a refined drapery of polished glass and metal. The message was clear enough: no longer did all the building's functions have to be shoe-horned into a symmetrical, classicized block: those activities which required more space could extend within the limits of the lower block, whilst the sideways-on tower could rupture the once inviolate street elevation. For many modernists the tower-on-podium promised an ideal marriage of function, science, economics and art. It is not surprising, therefore, that by the early 1960s this form had taken its place as orthodox hospital design practice, under the sobriquet "matchbox on a muffin". That this was possible depended on two developments, namely the acceptance of wards stacked in a tower, and a rethinking of the way in which people, goods and services were to be moved around the hospital, ushering in a range of mechanized systems of communication.

#### **The Genesis of the Tower-Block Hospital**

The Nuffield *Studies* had shied away from suggesting an architectural form for the whole hospital. However, the tower-on-podium offered a neat conceptual and aesthetically acceptable solution, with standardized ward units stacked over a mat of flexible, expandable diagnostic, outpatient and ancillary departments. This design was underwritten by promises of efficiency gains from the centralization of ancillary procedures in the lower block. The precedents to which British architects looked for guidance followed a clear pattern, which drew on British inter-war hospital towers, the large wartime hospitals built in neutral European countries, and finally the rationalized designs of post-war American hospitals. A crude architectural pattern also emerges, beginning with the inter-war attempts to squeeze all the various irregular departments into a solid, unbroken classicized façade, moving on to the dispersal of functions into linked parallel blocks, and concluding with the conceptual simplicity of the modernist tower-on-podium. In practice, when British architects sought to adopt the model—and not all did—the results rarely achieved the formal clarity of the ideal, given the reluctance or inability to centralize functions fully, and the problem of reconciling all the necessary departmental adjacencies with such a design.

Clearly, designers had long built high on tight urban sites, yet during the 1930s architectural flexibility remained constrained by the extent to which they dared

<sup>48</sup> 'Commercial, dead or alive', *Architectural Design*, August 1956, p. 243.



*Figure 8: Middlesex Hospital, Fitzrovia, London, Alner Hall, 1926–35.  
(Photo: Jonathan Hughes.)*

subvert the formal coherence of traditional, classicized, architectural style with the multifarious demands of the modern hospital brief. At both the Middlesex Hospital (1926–35, Figure 8) and Gordon Hospital (*c.*1948), architect Alner Hall had sought to accommodate all the various hospital functions within symmetrical, ordered forms maintaining a unified and classicized façade. Similarly, Adams Holden & Pearson’s Westminster Hospital (*c.*1938) displayed an unwillingness to transgress the demands of its stripped-down classicized façade.

European Modernists had little such reticence: most notably—for British hospital designers—Alvar Aalto’s Paimio Sanatorium (1928–33, Figure 5) offered a model for architects seeking a prototypical modernist tower form. Reproduced in nearly all the British inter-war pro-Modernist architectural texts, Paimio manifested not only a progressive ward design, but also offered the bold vertical configuration of

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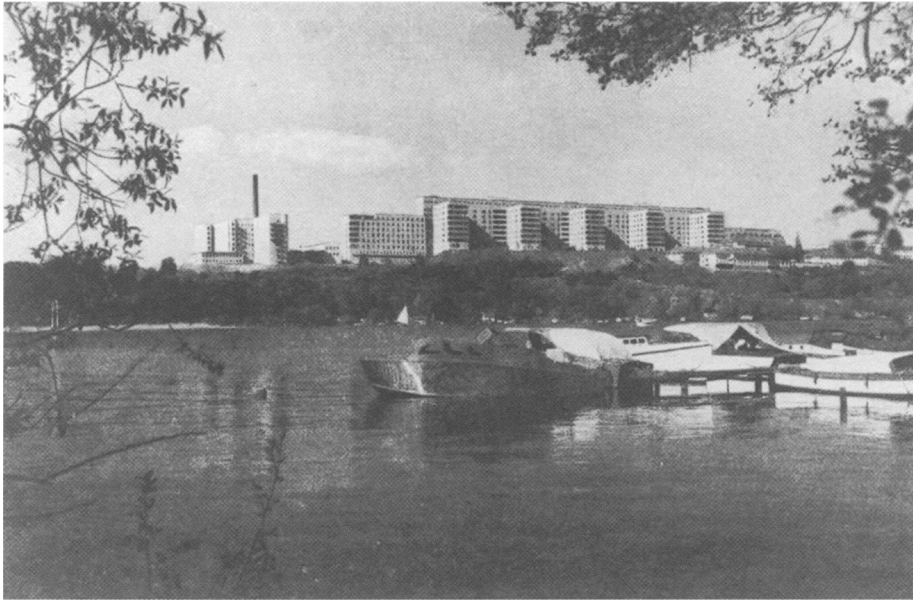
*Figure 9: Beaujon Hospital, Clichy, Paris, Jean Walter, Plousey & Cassan, 1935. From Gustaf Birch-Lindgren, *Modern hospital planning in Sweden and other countries*, London, Constable, 1951.*

wards which was to underwrite 1950s design. Yet Paimio was a tuberculosis sanatorium, with a narrow range of functions and it was to other precedents that post-war British architects turned for guidance. The Beaujon Hospital (Clichy, Paris, by Jean Walter, Plousey & Cassan, 1935, Figure 9) constituted a remarkable precedent—its 1,100 beds ranged in four south-facing, thirteen-storey, ward blocks sited along a spine of service accommodation. At its base a lower, linked group of outpatient, medical and surgical blocks centralized the diagnostic and major clinical functions.

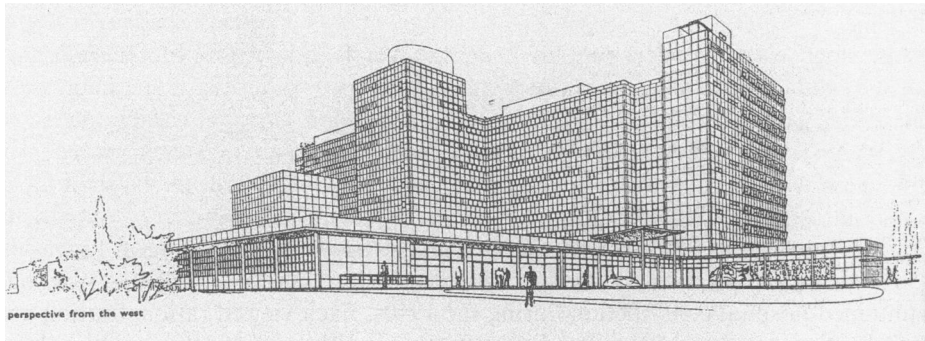
More importantly, Switzerland and Sweden, both neutral during the War, had maintained hospital construction during the 1940s. Each viewed rationalization and centralization as integral to a modern, effective health service—the resulting large vertical hospitals becoming sites of pilgrimage for British architects after the War.<sup>49</sup> Basel's Burgerspital (by Vischer, Braunig, Baur & Durig, c.1945) was especially notable, its 660 beds placed in a long, eight-storey ward block with a parallel three-storey diagnostic, surgical and outpatient block. Similarly, Stockholm's immense,

<sup>49</sup> Stuart Gray, architect of New Guy's House, Guy's Hospital, noted that the Caroline and South Hospital, Stockholm, the University Hospital, Zürich, and the Burgerspital, Basel, were all much visited (Stuart Gray, 'Studies in the functions and designs of hospitals', *Architect and*

*Building News*, 8 September 1955, pp. 289–97. W F Howitt, architect of the new St Thomas's Hospital likewise recalled extensive European reconnaissance visits (in conversation with the author, December 1993).



*Figure 10: Söder Hospital, Stockholm, Sweden, Hjalmar Cederström, 1938–43. From Gustaf Birch-Lindgren, *Modern hospital planning in Sweden and other countries*, London, Constable, 1951.*



*Figure 11: St Lô Hospital, Normandy, France, Paul Nelson, c.1949. From *Architectural Review*, March 1949.*

1,200 bed Söder Hospital (Hjalmar Cederström, 1938–43, Figure 10) was lauded by British designers as a masterpiece of standardization and hospital organization and planning.

It was, however, American thinking which ultimately propagated the “matchbox on a muffin”, demonstrated at Paul Nelson’s 400-bed St Lô Hospital (Normandy, c.1949, Figure 11). The Franco-American architect was well placed to assimilate

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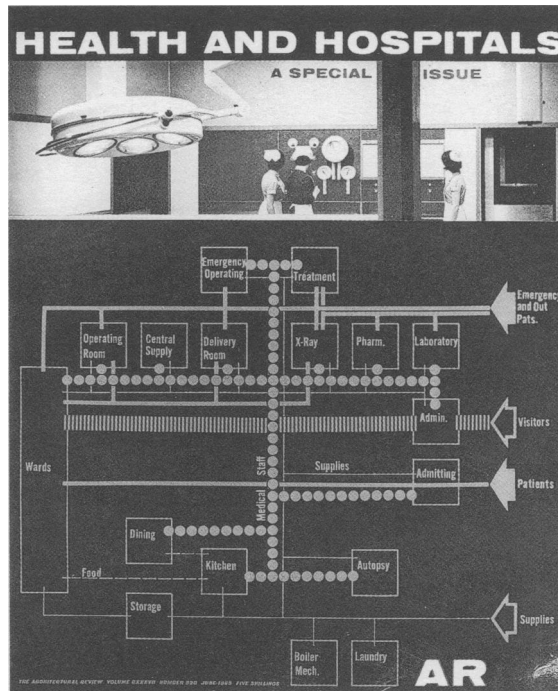


Figure 12: Cover of *Architectural Review*, June 1965, with Gordon Friesen flow chart.

both the Taylorist approaches prevalent in America,<sup>50</sup> and the modernist sensibility of inter-war Europe. Nelson’s unrealized 1932 project for the Cité Hospitalière de Lille<sup>51</sup> had already deployed ward towers over a lower block, a solution to be repeated at St Lô, where the outpatient and medical services were placed in a lower mat, below an eight-storey ward block. Its functions were clearly separated and articulated, with circulation vertically centralized at the core of the building.

The industrialization of this model was subsequently advanced in a series of ten hospitals completed in 1956 across Virginia and Kentucky to a brief prepared by hospital administrator Gordon Friesen for the United Mineworkers of America Welfare and Retirement Fund. Friesen’s work sought to exploit Taylorist possibilities to the full, removing the maximum number of functions from the ward to remote, centralized departments where their work could be more easily surveyed, controlled and rendered more efficient through the application of work-flow studies, job specialization and mechanization (Figure 12). The “matchbox on a muffin” form was an ideal one in which to plan a vertical central core of mechanized distribution systems rising from a central dispatch centre located in the podium serving the wards

<sup>50</sup> Edward Morman (ed.), *Efficiency, scientific management and hospital standardization: an anthology of sources*, New York, Garland, 1989.

<sup>51</sup> ‘Health city of Lille, France’, *Architectural Record*, 1935, June, pp. 408–9; also, Terence Riley and Joseph Abram, *The filter of reason: the work of Paul Nelson*, New York, Rizzoli, 1990.

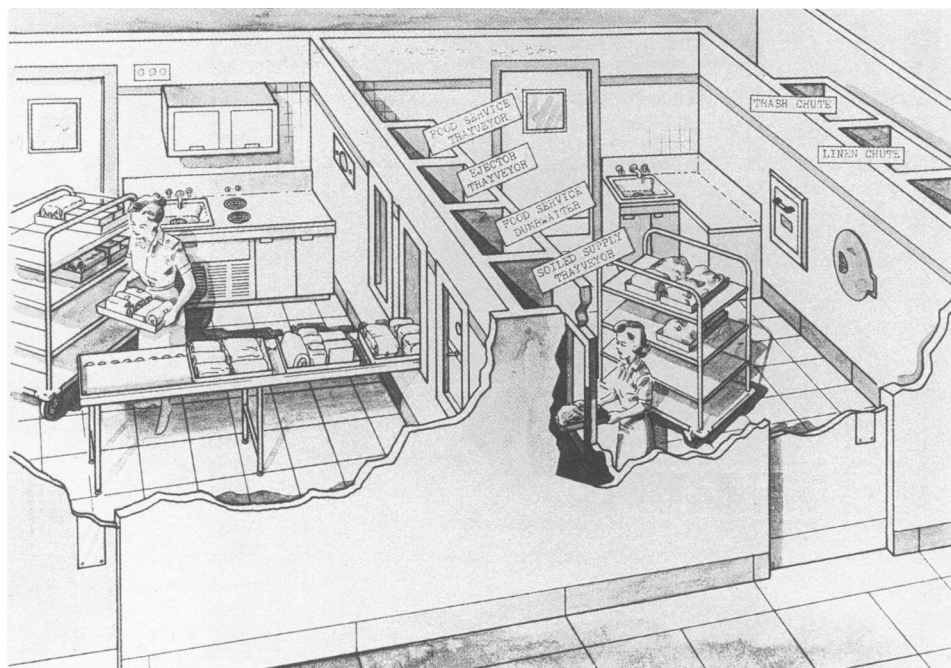


Figure 13: Illustration of ward supply centre, Gordon Friesen, c.1962. From George H Bell (ed.), *Hospital and medical school design*, Edinburgh and London, E & S Livingstone, 1961.

above (Figure 13). All sterile requirements were to be provided from a Central Sterile Supply Department (CSSD) via lifts; similarly catering needs, with meals prepared in a single, whole-hospital kitchen and distributed to the wards via a “trayveyor”—the used utensils being returned to a central wash-up facility. There were to be no storage cupboards for clean utility; wards would be provided daily with a trolley-load of supplies. Pneumatic tubes were to deliver x-rays, specimens and notes around the building, economizing on portage and delivery time. As Friesen put it, “In an age of mechanization, logic dictates that some of the production methods of industry should be applied to certain areas of the hospital.”<sup>52</sup>

Three of Friesen’s ten Mineworkers’ schemes were general hospitals,<sup>53</sup> with Harlan Hospital most insistently adopting the pristine cubic forms of SOM’s Lever House. John Weeks noted in 1959, “The atmosphere is very like that of an industrial concern and indeed Americans often talk of a ‘health plant’ instead of ‘hospital’”, adding that Friesen’s work was “undoubtedly the most fascinating development since the War in the United States”.<sup>54</sup> Likewise, W J Jobson, Chief Architect of the Oxford

<sup>52</sup> Gordon Friesen, ‘Mechanization and hospital design’, *Architectural Design*, January 1961, pp. 7–9.

<sup>53</sup> Beckley by Isadore Rosenfield, Williamson by York & Sawyer, and Harlan by Sherlock, Smith & Adams.

<sup>54</sup> John Weeks, ‘Developments in the United States of America’, *RIBA Journal*, January 1959, pp. 83–7.



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Regional Hospital Board, studied hospital business, its mechanization and its effect on the nursing floor in America—his findings were published alongside an article by Friesen in a 1961 issue of *Architectural Design* devoted to ‘Mechanization and hospital design in Britain’, edited by Weeks.<sup>55</sup>

The difference with British practice was most striking in the administrative organization of American medical provision, centred on a more profit-driven, meritocratic, managerial structure, rather than a nationalized system still dominated by prominent medical personalities and an ingrained class structure. Yet Britain was changing, and the American model was not to be lost on hospital architects swept along by the rhetoric of Harold Wilson’s white-hot “scientific revolution”. Like Wilson’s new Britain, the new NHS hospital was not just to be modern, but more meritocratic, mechanized and efficient. This perhaps was the hospital in which Bevan had, in 1946, hoped to expire—a hospital in which efficiency and quality of care went hand in hand. Automation promised to make this vision a reality, as a 1956 Department of Scientific and Industrial Research report had noted: “Like other advances in technique, [automation] will increase efficiency and should, therefore, reduce costs.”<sup>56</sup> Nor was it necessarily an over-optimistic vision. British commentators had noted the centralized laundries, kitchens and CSSDs in continental European hospitals soon after the War, prompting the NPHT to initiate research into CSSDs. Indeed, the trend towards centralization may be noted in Britain from the 1930s, just as the development of the sub-divided ward, suitable for stacking in a tower, was likewise underway before the War. As the *Architects’ Journal* had noted in 1937:

... there will be a definite trend towards higher buildings ... the advantages gained by centralized services are obvious, and vertical plumbing and service stacks can simplify what is usually a very complicated series of installations. It seems likely also that the higher building of five to eight storeys would be cheaper in maintenance costs—assuming equal accommodation.<sup>57</sup>

The majority of the large post-war British hospital schemes adopted some variant of the tower-on-podium form, whether or not site constraints demanded that the architect build upwards rather than outwards. The logic of rapid vertical communications, the constructional simplicity of repetitive ward floors, and the impressive architectural statement of the high-rise tower combined to make the “matchbox on a muffin” an appealing design solution for the modern hospital. Indeed, it was only Powell & Moya’s Wexham Park Hospital, Slough (1955–66), which, during the 1950s, consciously, and with much publicity, dared to propose a predominantly single-storey whole-hospital design—a strategy which however would

<sup>55</sup> W J Jobson, ‘Hospital business, its mechanization and its effect on the nursing floor’, *Architectural Design*, January 1961, pp. 12–16.

<sup>56</sup> Department of Scientific and Industrial Research, *Automation*, London, HMSO, 1956, p. 80.

<sup>57</sup> D R Harper, ‘Today and tomorrow: the architectural view’, *Architects’ Journal*, 24 June 1937, pp. 1099–1104.



Figure 14: Altnagelvin Hospital, Londonderry, Yorke Rosenberg & Mardall, 1949–60.

remain unrepeatable until the end of the 1960s.<sup>58</sup> Typically, architects accepted the rationale of the “matchbox on a muffin” for whole hospital schemes, albeit at times initially misinterpreting the underlying principles of the approach.

An early post-war vertical hospital was the Queen Elizabeth II Hospital, Welwyn (by C D Andrews, Chief Architect North West Metropolitan Regional Hospital Board, 1955–63). Using a T-shaped tower, the hospital located the medical and ancillary services in a stack forming the stem of the T, whilst the wards were placed in the cross-bar. All matchbox and no muffin, the hospital was condemned as obsolescent from the start,<sup>59</sup> the vertically-layered clinical departments offering poor inter-departmental relationships and little scope for expansion. Indeed, all the departments had to be squeezed into identical floor templates, causing the fourth-floor operating theatres to bulge out of the side.

A similar example was offered by Yorke Rosenberg & Mardall’s Altnagelvin Hospital (1949–60, Figure 14)—possibly the United Kingdom’s first post-war hospital.

<sup>58</sup> The low-rise approach would inform Paul James’s designs for Airedale Hospital, Eastburn (1965–70), and Leighton Hospital, Crewe (1965–71), but would only be widely applied in the Ministry/DHSSs Best-Buy, Harness and Nucleus projects of the 1970s and 1980s. Even Powell & Moya’s celebrated Princess Margaret

Hospital, Swindon (1954–60), which proposed an extensive low-lying mat of outpatient accommodation, was but the first phase of a whole hospital design which placed its inpatient wards in a tower.

<sup>59</sup> ‘Planning for obsolescence’, *Architects’ Journal*, 31 July 1963, p. 210.

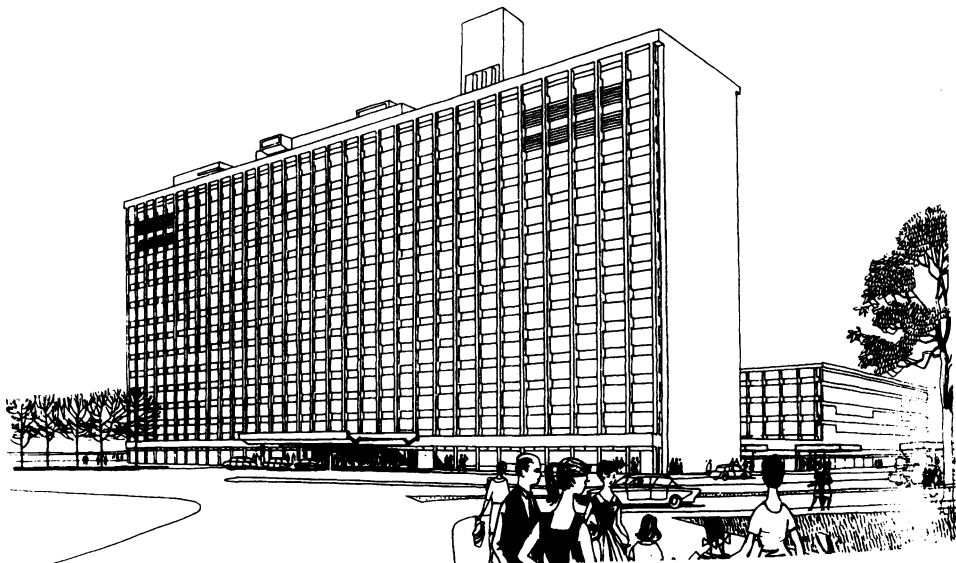


Figure 15: Hull Royal Infirmary, Hull, Yorke Rosenberg & Mardall, 1957–65.

Standing alone in an expanse of fields, it was clear that lack of space had not dictated this design: the twelve floor L-shaped tower housed wards in one wing and diagnostic and treatment facilities in the other, with outpatient clinics occupying the larger ground floor. It was not until 1957 that Yorke Rosenberg & Mardall wholeheartedly adopted the “matchbox on a muffin” at Hull Royal Infirmary (1957–65, Figure 15), where the Altnagelvin L-shaped plan was replaced with a simple block of wards over a lower mat of ancillary, diagnostic and outpatient facilities.

Such a development of design strategy was not uncommon, as architects began to refine their schemes. Indeed, of the major projects announced in the late 1950s (see notes 12 and 13 above) nearly all placed their wards in a tower over ancillary accommodation, although few achieved the architectural simplicity of Yorke Rosenberg & Mardall’s “clean sliced cliff”<sup>60</sup> at Hull, and several opted for chains of medium-rise towers to house all the ward accommodation. None the less, others would soon follow suit—for example at Barking, London (North East Metropolitan Regional Hospital Board, 1963–7) and Fazakerly General, Liverpool (Liverpool Regional Hospital Board, c.1965). Such a transition towards the “matchbox on a muffin” may be traced through two early post-war projects at London’s Guy’s and St Thomas’s hospitals, schemes which demonstrate how the tower-block form would not always be achieved without concerns over the architecture or the programme of the modern hospital.

<sup>60</sup> Philip Larkin, ‘The building’, in *High windows*, London, Faber & Faber, 1974.

### An Uneasy Transition: Guy's Hospital

Founded in 1724 in Southwark, Guy's Hospital became not only a major London hospital, but also a medical school of great repute, bringing with it a series of architectural accretions over two centuries. Yet, by the 1930s, the inadequacy of some of its accommodation—as old as the institution itself—was readily apparent and the possibility of rebuilding was considered. Its subsequent reconstruction demonstrates not only how designers sought to cope with the problems of the large vertical hospital, but also how architecture could signify positive and negative aspects of the modern world. Indeed, the first post-war scheme—New Guy's House—evidenced a reluctant modernity symptomatic of a deep-seated anxiety over the appropriateness of modern architectural form.

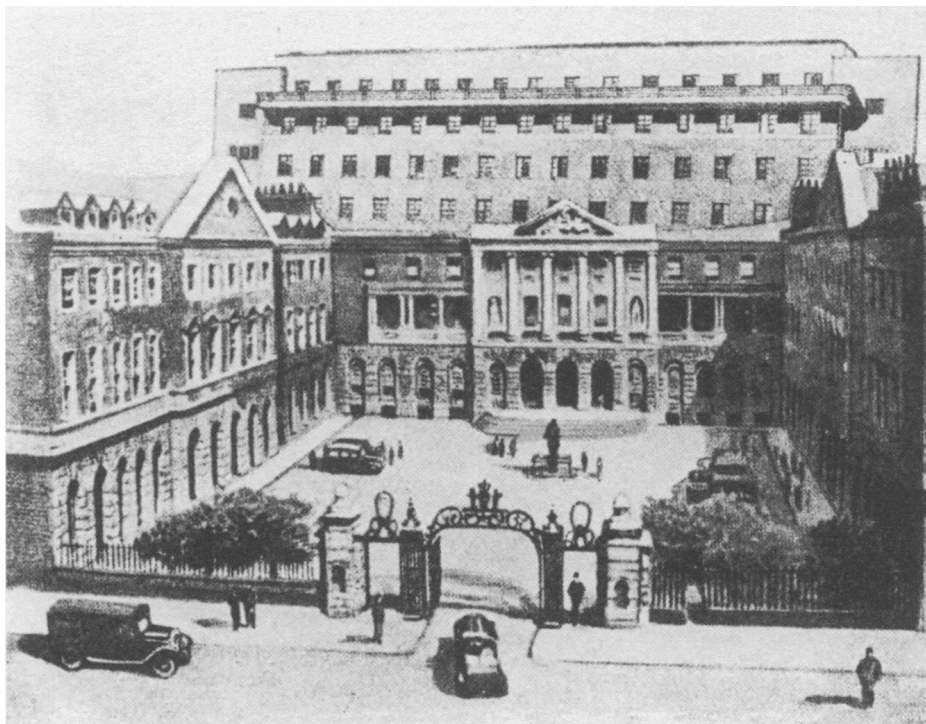
In 1936 the rumoured demolition of Guy's House—the spiritual home of the Hospital—as part of a scheme to rebuild the surgical facilities brought a lively defence of the 1725 quadrangle. Articles in the Hospital's *Gazette* made plain the fear that rebuilding would be underwritten by a pernicious modernist functionalism, and indicated the ease with which commentators could align architectural design and a Taylorist approach to work study with one another:

... the tradition of service and teaching is not going to be in anyway improved by the demolition of what is fine and beautiful in the Hospital; rather it will suffer, for in these days of hustle and bustle and so called efficiency, when values of things are judged by whether they will save one a few minutes' or seconds' work, it is good to have a reminder that our forerunners with no labour saving devices at their disposal could still find time to set store by the fine exterior to their Hospital, which exterior was in some measure a reflection of the quality of their minds.<sup>61</sup>

The hospital architect, William Walford, offered a ludicrous compromise retaining the two side wings and the central façade of the original building, with the new accommodation directly above in stripped-down classical style (Figure 16). The proposals were considered inadequate and were shelved with the onset of War. However, with the bombing of the Hospital during the Blitz which destroyed the east wing of Guy's House, the attractions of rebuilding were once again evident and in 1942 a post-war Planning Committee was established. Given Walford's impending retirement, Alner Hall, of Young & Hall (architects of the recent Middlesex Hospital) was appointed in 1943 to prepare plans for a major rebuilding programme. Meanwhile, the Clerk to the Governors, Bertie Lees-Read, and the Treasurer, J E Humphrey, recognized the opportunity for the expansion of the Hospital onto bombed land to the east, Great Maze Pond, and embarked on a twelve-year mission to purchase the site. Hall's first plans were produced in 1944, providing for a 1,000-bed hospital in one main, and one smaller block; necessitating the demolition of nearly everything on the site (Figure 17). However, the main block was deemed to provide impractical inter-departmental links and Hall redesigned the accommodation first in smaller units and subsequently as a snowflake-shaped hospital utilizing the

<sup>61</sup> 'Passim', *Guy's Hospital Gazette*, 18 December 1937, pp. 519–20.

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*Figure 16: Guy's Hospital, London, proposal for rebuilding Guy's House, William Walford, 1936. Courtesy of King's College London.*

whole site (Figure 18). This required the demolition of Guy's House, and foresaw three spokes radiating from a central tower, further splitting into three ward units each comprising Guy's traditional L-shaped 20-bed open ward with five single rooms.

The administrative upheaval occasioned by the inauguration of the NHS briefly curtailed any rebuilding plans. With a change of heart over the fate of the quadrangle and the September 1949 Ministry decision that hospitals be limited to 800 beds for civil defence reasons,<sup>62</sup> the "snowflake" plan was recast in similar form in 1951, albeit restricted to the site east of Great Maze Pond. Hall was now aided by architect Paul Burt, of the American firm Fugard, Burt, Wilkinson & Orth which had designed the Wesley Memorial Hospital in Chicago—Burt being deemed to have additional insight into the circulation and planning problems of a large and tall hospital. The proposed exterior of the building provoked criticism, its brick and stone cladding prompting negative, if contradictory, responses. One reader hoped "that any plans for rebuilding Guy's will not sacrifice beauty for utility", and noted that "there is a deplorable tendency nowadays to build awful structures . . . uncompromisingly hideous, and emanating, I believe, in the first place from America."<sup>63</sup> Alternatively,

<sup>62</sup> Bertie Lees-Read, 'The new Guy's', *ibid.*, 22 October 1949, pp. 327–8.

<sup>63</sup> G Dunderdale, 'Correspondence', *ibid.*, 24 March 1951, p. 124.

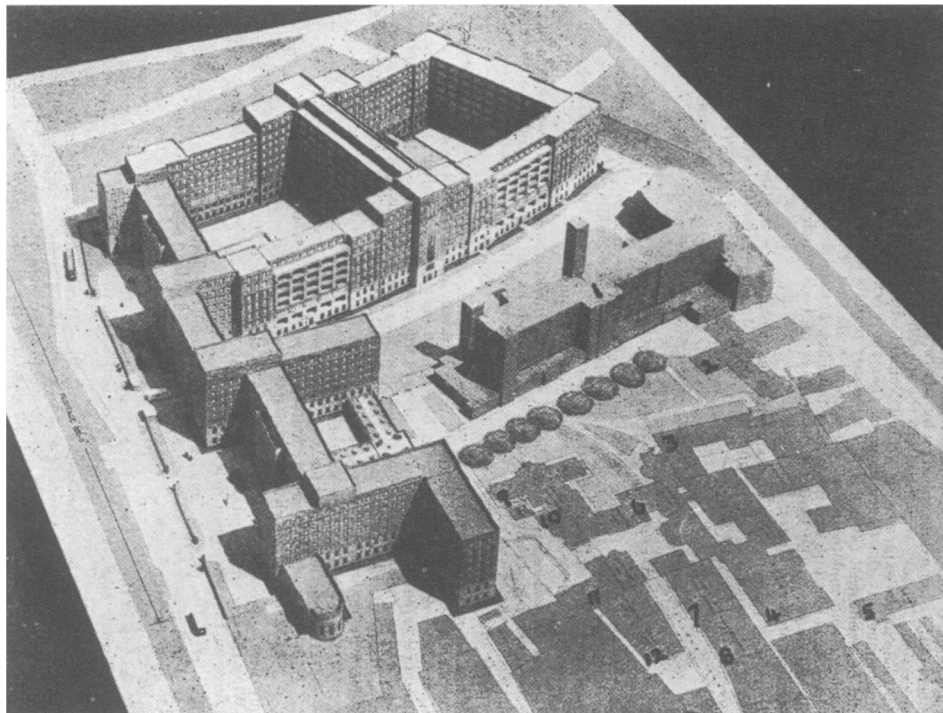


Figure 17: London, Guy's Hospital, rebuilding scheme, Alner Hall, 1944. Courtesy of King's College London.

a *Gazette* reader with more progressive architectural taste lamented, “How sad that a great hospital, so very much in the van in matters medical and surgical, should allow itself to be so lamentably in the rearguard architecturally.”<sup>64</sup> Indeed, in one attack on the architect’s “Georgian” façades there came the suggestion that Hall might profitably look at the work of modern architects Frank Lloyd Wright and Eric Mendelsohn:

If ever buildings require to be “functional”, hospital buildings are such. Guy’s is not a collection of individual homes under one roof, and therefore cannot be expected to look like Dolphin Square, as suggested by the models. On the contrary, Guy’s is a *humanistic factory*, and cannot afford to look like anything but what it is. This is not a matter of taste, which notoriously is not debatable, but of efficiency, which is a matter of economy of means to obtain service and amenity.<sup>65</sup>

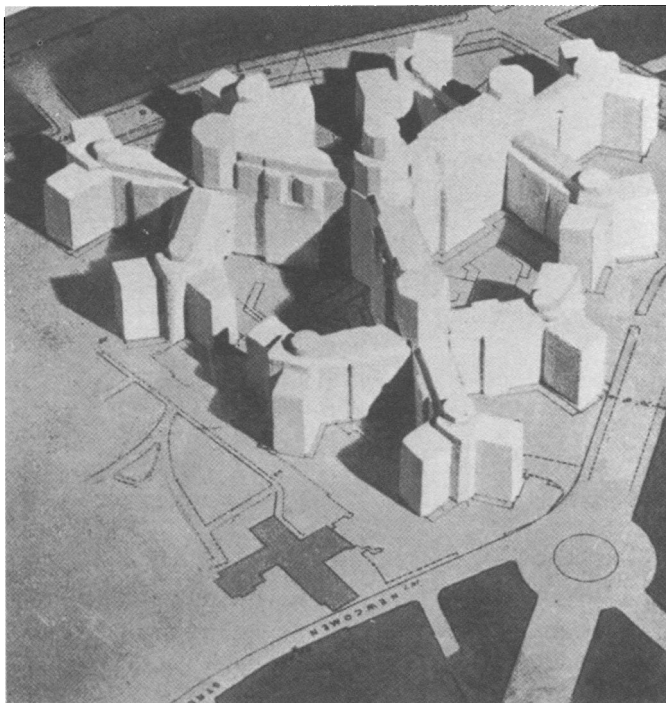
Hall’s 1951 “snowflake” design was abandoned in late 1954 due to financial and town planning obstacles, and Ministry objections to the commitment of the Hospital to such a singularly large scheme.<sup>66</sup> Given Hall’s deteriorating health, new architects

<sup>64</sup> ARIBA, ‘Correspondence’, *ibid.*, 29 November 1952, p. 466.

<sup>65</sup> A Thompson, ‘Correspondence’, *ibid.*, 23 December 1944, p. 283, my emphasis.

<sup>66</sup> Bertie Lees-Read, ‘The planning and erection of New Guy’s House’, *New Guy’s House, commemorative brochure*, 1961, pp. 19–23.

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*Figure 18:* London, Guy's Hospital, "Snowflake" rebuilding scheme, Alner Hall, 1951. Courtesy of King's College London.

were appointed, and by 1957 the Minister of Health could announce the rebuilding of Guy's surgical block to provide new operating theatres and 378 beds.<sup>67</sup> The block was to be built on the newly acquired land and to stand alone yet be capable of assimilation into a later redevelopment plan; as such it was to be twelve storeys high to minimize its footprint and offer the greatest scope for later planning.

The new architects were Watkins Gray, a practice which had made its name abroad designing hospitals in the West Indies following the firm's winning entry in the St George's Hospital, Hyde Park Corner, London, competition just before the outbreak of War. The firm had been founded in 1903 in Bristol by William H Watkins (1878–1964) and, unswayed by modernist dogma, deployed styles and mannerisms as applicable. It expanded on lucrative commissions for shops, offices, public houses and, in particular, cinemas. Watkins' later partner, Stuart Gray (1905–1998) joined the practice briefly to work on a cinema commission, before leaving to join Adams Holden & Pearson, working under Lionel Pearson on the designs for the new Westminster Hospital (1938–9). Poached back by Watkins to open a London office in 1936, an initial surfeit of work rapidly disappeared and prompted them to enter

<sup>67</sup> 'Passim', *Guy's Hospital Gazette*, 27 April 1957, p. 171.

*Jonathan Hughes*

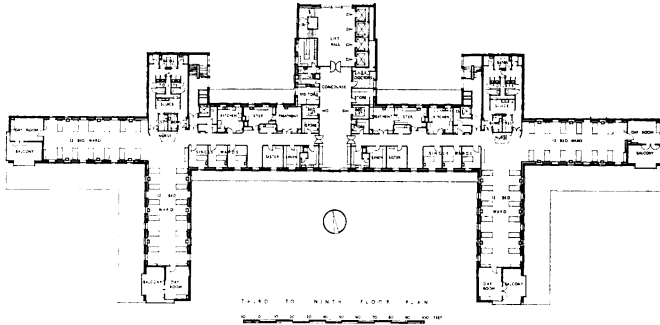


Figure 19: Guy's Hospital, New Guy's House, London, Watkins Gray, 1955–61. Plan of ward floor. From *New Guy's House*, commemorative brochure, 1961.

competitions. Drawing on his work with Adams Holden & Pearson, Gray formulated the prize-winning design for the 1938 St George's Hospital competition. The decision proved controversial—not least to modernists who saw little of merit in Gray's monumental, Edwardian, stripped-down classicism. However, for the practice the competition was to prove a springboard on to other projects in the Caribbean and Africa.

Gray's plan for the new surgical building at Guy's (Figures 19 and 20) retained the L-shaped open wards of Hall's scheme, justified against the Nuffield-backed trend for compartmentalized wards since, as the architect declared, "the additional burden on the nurses, which such small wards cause, was not justified by economic and social circumstances and because there seemed little evidence that patients preferred them".<sup>68</sup> The seven narrow ward floors on the upper storeys, with the operating theatre and other accommodation on the ground, first and second floors extending out from the rear elevation (not visible in Figure 20), provided a contrast between the brick-faced ward floors above and the framed operating floors below, thereby formalising (albeit with some reticence) the split between the tower and the notional podium elements.

News of the £2.25m scheme was greeted with enthusiasm. Press commentators were captivated by this "semi-skyscraper", noting that it "should be the tallest and certainly the most up-to-date hospital in Great Britain".<sup>69</sup> The sentiments were echoed upon the building's opening in 1961, the *Evening Standard* declaring "If only they were all like this!",<sup>70</sup> whilst the *Illustrated London News* remarked, "The new

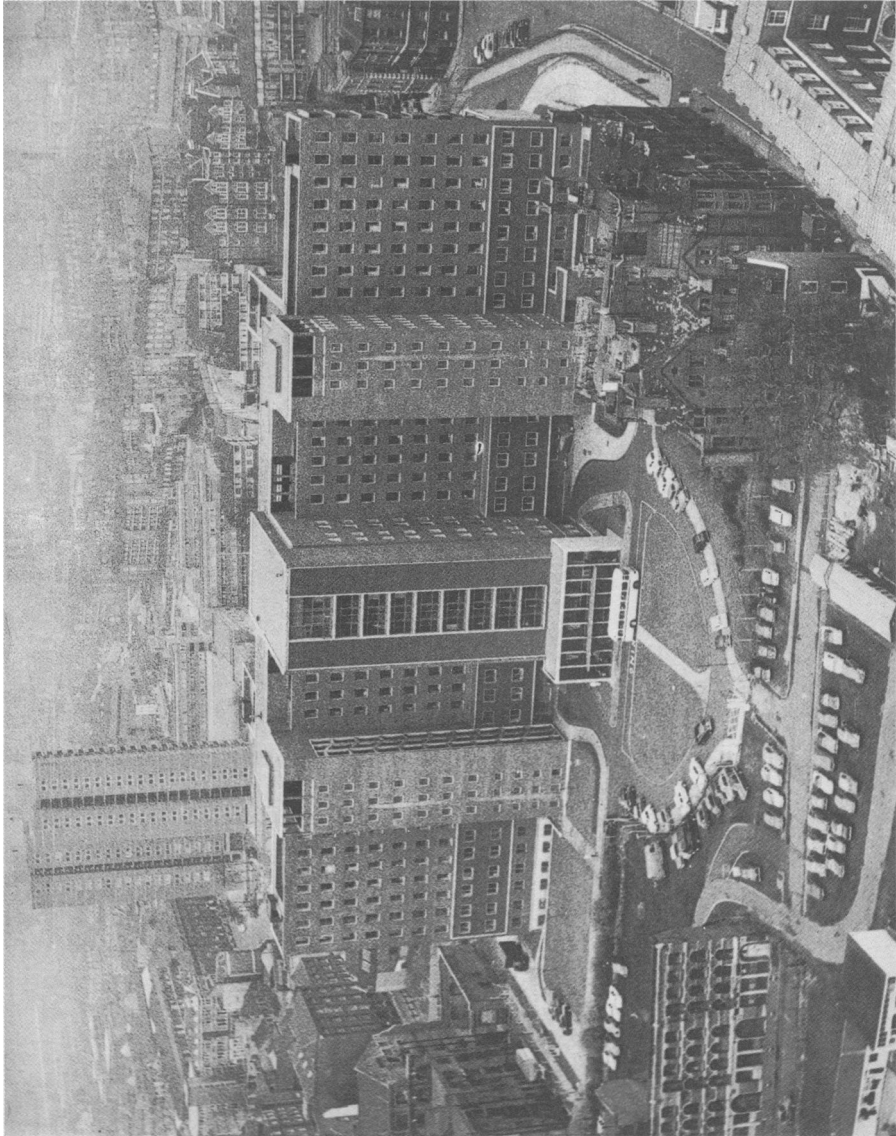
<sup>68</sup> Stuart Gray, 'Description of architectural features', *New Guy's House*, commemorative brochure, 1961, pp. 24–6.

<sup>69</sup> 'Guy's rebuilding begins', *The Times*, 21 September 1957, p. 4; 'Rebuilding of Guy's

Hospital, London', *Builder*, 27 September 1957, p. 529.

<sup>70</sup> F Entwistle, 'If only they were all like this!', *Evening Standard*, 23 October 1959.





*Figure 20: London, Guy's Hospital, New Guy's House, Watkins Gray, 1955–61. View. Courtesy of Southwark Local Studies Library.*

Guy's House, near London Bridge, is the 'last word' in modern surgical science".<sup>71</sup> The provision of piped medical gases, bed-side telephone points and washbasins between beds were all seen as advances, as was the CSSD. However, detractors seized upon the "old-fashioned" open wards, and initiated correspondence in *The Times*, with Dr Stark Murray declaring the block "obsolete before it was ever put on paper and if we follow it and perpetuate open wards, British hospitals will, in spite of all the electrical and electronic devices, remain obsolete".<sup>72</sup> Amongst its faults, critics noted that the unsatisfactory entrance to the ward passed the sluice and the very sick in the single rooms; whilst the patients' day room was distant. The resulting debate on the merits of the building, like the King Edward's Hospital Fund evaluation of it in 1963,<sup>73</sup> proved inconclusive, although the Hospital subsequently adopted sub-divided wards in its next phase of rebuilding (Guy's Tower, Watkins Gray, 1963–76). The architecture similarly evidenced an equivocal stance. Its projecting lower storeys hinted at a willingness to express the differing requirements of the various departments housed under the wards (a solution largely unthinkable in Britain before the War), whilst its CSSD suggested an engagement with contemporary trends towards the industrialization and centralization of ancillary processes. However, externally, its brick elevations and stone dressings were hardly evocative of the "machine age" sophistication of Lever House. Perhaps mindful of the blunt criticisms levelled at modernism by hospital staff before the War, New Guy's House promoted a stylistic and programmatic compromise between modernity and tradition. Yet, elsewhere along the Thames, at St Thomas's Hospital, there were fewer reservations about creating a legibly modern architectural form for the hospital.

### Modernity and Efficiency: St Thomas's Hospital

Formerly the senior neighbour of Guy's Hospital near London Bridge, St Thomas's Hospital relocated to Westminster in 1871. Its new buildings were designed by Henry Currey and were based on Paris's Lariboisière pavilion plan hospital, with colonnaded Italianate pavilions aligned along the Thames. Subsequently extended, these formed the basis of the 600-bed twentieth-century hospital and medical school. The buildings suffered severe bombing in the Second World War, forcing the Hospital temporarily to relocate to Godalming. The need to rebuild was readily evident and a Constructional Panel, consisting of Governors, medical staff, lay officers and outside consultants, was established in 1941 to

<sup>71</sup> 'The new block at Guy's: a great addition to a famous London hospital', *Illustrated London News*, 6 May 1961.

<sup>72</sup> Stark Murray, 'New block at Guy's: has an opportunity been missed?', *The Times*, 4 November 1960.

<sup>73</sup> King Edward's Hospital Fund for London, *An evaluation of New Guy's House*, London, King Edward's Hospital Fund for London, 1963.

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formulate “a provisional programme for the entire remodelling of the Hospital”.<sup>74</sup> In 1944 eminent town-planner Professor Sir William (later Lord) Holford<sup>75</sup> was appointed consultant architect with a brief to produce plans for a 1,000 bed hospital (in line with the 1944 Goodenough Report<sup>76</sup>). Furthermore the creation under the NHS in 1948 of the 1,000-bed St Thomas’s Hospital Group (including other satellite hospitals) prompted attempts to centralize it on the main Westminster site—albeit a desire soon curtailed by the Ministry’s 1949 800-bed limit on the size of hospitals for civil defence reasons.

Holford, with Leslie Creed, produced the *Preliminary report on the reconstruction of St. Thomas’s Hospital* in May 1946, which suggested rebuilding the hospital on the original foundations, and the sub-division of the Nightingale wards.<sup>77</sup> Elaborated in their third and final April 1950 report,<sup>78</sup> the suggestion of greatest importance was to be the diversion of Lambeth Palace Road to increase the hospital site from 8.5 to 14.5 acres and “give more scope in planning the future accommodation.”<sup>79</sup> Paid for by the Hospital’s own endowment funds, the £3m scheme was completed in 1961.

Holford’s recommendations bore little fruit: reconstruction work was initially delayed until December 1949 whilst the Ministry of Health debated St Thomas’s future in central London. Holford and Creed’s proposals achieved a 1,000-bed hospital by heightening the rebuilt pavilions, subdividing the Nightingale wards, and inserting mezzanine floors into ancillary areas. This was less costly than complete rebuilding and advantageously retained Currey’s riverside pavilions (reputedly demanded by Winston Churchill), whilst also retaining the Archbishop of Canterbury’s view of Big Ben from his toilet in Lambeth Palace. However, apart from a number of contemporary, “New Look”, chandeliers in the staff dining room for the 1951 Festival of Britain celebrations, Holford and Creed completed only one project at the Hospital. This small operating theatre block (Block VIIa) of 1956 was built on Currey’s foundations as envisaged in the original proposals, its façade a plain, modern, pattern of brick and infill (Figure 21).

In 1955 the discovery of widespread dry rot forced the abandonment of Holford and Creed’s plans for the rehabilitation of the existing structure. And so, for the necessary wholesale rebuilding, a staff architect, William Fowler Howitt,<sup>80</sup> was appointed in 1955 to oversee the construction of the operating theatre block, and

<sup>74</sup> Arthur Howard, ‘Foreword’ in William Holford and Leslie Creed, *Studies for the reconstruction of St Thomas’s Hospital, Lambeth*, London, St Thomas’s Hospital, 1950.

<sup>75</sup> Gordon Cherry and Leith Penny, *Holford: a study in architecture, planning and civic design*, London, Mansell, 1986.

<sup>76</sup> The report proposed an annual intake of 100 medical students for a teaching hospital, dictating a minimum of 1,000 beds to offer a wide enough range of illness to its students (Ministry of Health, Inter-Departmental

Committee on Medical Schools, *Report of the Inter-Departmental Committee on Medical Schools* (Goodenough Report), London, HMSO, 1944, ch. 3, para. 27).

<sup>77</sup> Reprinted in Holford and Creed, op. cit., note 74 above, appendix A.

<sup>78</sup> Ibid.

<sup>79</sup> Ibid., p. 25.

<sup>80</sup> Howitt, a Rome scholar, had qualified from Dundee School of Architecture in 1948 and worked on the Cork Regional Hospital project in Dublin after the War.



Figure 21: St Thomas's Hospital, London, Block VIIa, Leslie Creed, 1956.

prepare reconstruction schemes for the whole hospital. Advised by Holford, and given almost a *tabula rasa*, the plans progressed through a series of eight alternatives outlining different building orientations and ward layouts, each one uneconomical or unacceptable to the hospital's neighbours—including the Church Commissioners (Lambeth Palace being adjacent), the London County Council (County Hall also being adjacent), the Royal Fine Art Commission and the Palace of Westminster (over the Thames).

When finally agreed, Scheme 8 formed the basis for the rebuilding of the 800-bed hospital.<sup>81</sup> The plans foresaw a massive 150 ft high, twelve-storey ward block of 827 beds, to be built in one strip in four phases, parallel to the river (Figure 22). Each phase was based on a T-shaped ward plan with the entrance to each 28-bed ward (along with its associated ancillary accommodation) at the centre of the long side of the ward. Beds were placed in bays of four (in Nuffield fashion), or in single rooms—to permit the more flexible allocation of beds into medical/surgical or male/female portions. Separate patient treatment rooms were provided to reduce cross-infection, and day rooms were incorporated to encourage early ambulation. Beneath the ward block was to be a four-storey outpatients and casualty block with operating theatres, linked to the wards via four communications towers at the stems of the T-shaped blocks (Figure 23). On the

<sup>81</sup> William F Howitt, *Proposals for the rebuilding of St Thomas's Hospital*, London, St Thomas's Hospital, 1957.

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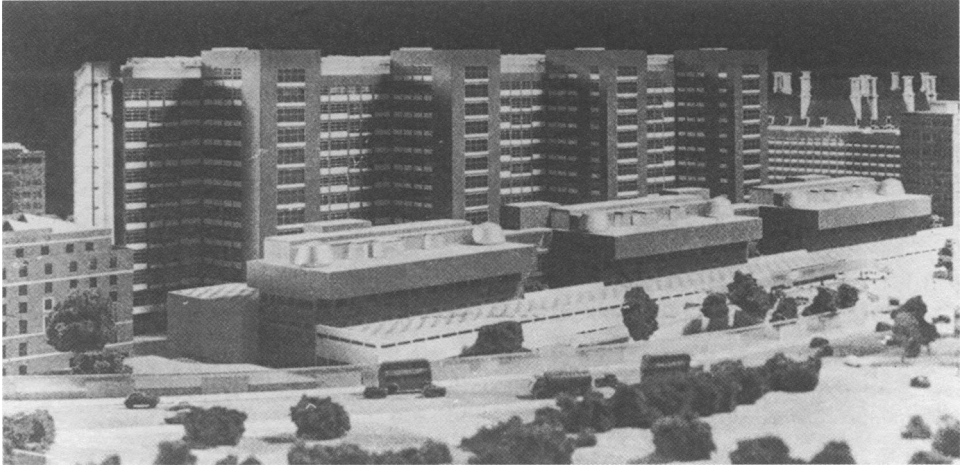


Figure 22: St Thomas's Hospital, London, rebuilding scheme, William Howitt, 1956–63. View of model. From George H Bell (ed.), *Hospital and medical school design*, Edinburgh and London, E & S Livingstone, 1961.

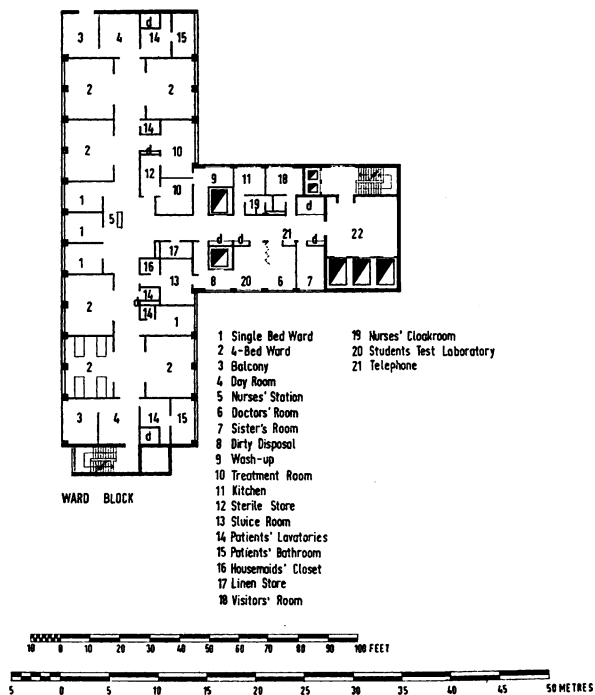


Figure 23: St Thomas's Hospital, London, rebuilding scheme, William Howitt, 1956–63. Plan of ward. From George H Bell (ed.), *Hospital and medical school design*, Edinburgh and London, E & S Livingstone, 1961.

lower levels were to be central catering and sterile supplies departments serving the whole hospital. The scheme echoed continental hospital layouts, in particular Stockholm's Söder Hospital and Basel's Burgerspital, with their ward towers and lower ancillary blocks—buildings visited during Howitt's tour of modern European hospitals in 1956.<sup>82</sup> With its pneumatic tubes for the delivery of medical records, laboratory specimens and notes, as well as its bed-head sited piped medical gases and suction, Howitt's scheme embodied many of Friesen's principles. Its central laundry, kitchen and CSSD removed catering and cleansing functions from the wards, whilst its Intensive Care Unit (one of the first in England) applied the same principle of specialization, grouping all patients in need of special care in a dedicated unit rather than on individual wards.<sup>83</sup>

The first stage of the £7–8m plan, announced in January 1958, received an enthusiastic press—commentators noting the facilities of this “Dream Hospital”:

Britain's boldest hospital plan ... the block will be so modern it will be a patients' and doctors' paradise ... it will have: panoramic views over London, menu meals on individual trays, patient-to-nurse call system, bedside radio links, and air conditioning ... [It will be an] ultra-modern hospital which will tower over Westminster.<sup>84</sup>

Likewise, the *Star's* correspondent observed that “It will be in every way a complete masterpiece in hospital building and one of the best equipped in the world for medical work in all its most up-to-date scientific aspects.”<sup>85</sup> After a decade of inaction, here at last was proof that the NHS was to back its radical social programme with buildings to match. The optimism was, however, to be short-lived, as progress was hindered by replanning to facilitate “greater centralization and thus better management”,<sup>86</sup> Ministry delays, shortages of materials and the scarcity of qualified architects. Given the limited nature of the work available in Howitt's office and the Ministry's low pay-scales, the office's inability to attract qualified staff was placing the whole project in jeopardy: as Howitt wrote to Holford, “our state is desperate”.<sup>87</sup> The publication in 1962 of Enoch Powell's ten-year *Hospital plan* proved pivotal, giving St Thomas's additional responsibilities and suggesting an optimum capacity of 1,255 beds. It proved impossible for the stretched architect's department to replan the building to accommodate the additional 400 beds and subsequently, on 7 August 1963, Yorke Rosenberg & Mardall were appointed to prepare a new master plan for the hospital—the

<sup>82</sup> Howitt recalls visiting Denmark, Norway, Sweden, Germany and Switzerland to look at current building. In conversation with the author, December 1992.

<sup>83</sup> E M McInnes, *St Thomas' Hospital*, 2nd ed., London, George Allen & Unwin, 1990, p. 182.

<sup>84</sup> Newspaper cutting, St Thomas's Hospital archives, no date or bibliographic details.

<sup>85</sup> T Watson, ‘Arise St Thomas's—finest hospital in the world’, *Star*, 15 December 1959, p. 5.

<sup>86</sup> ‘Work to start on rebuilding £13m hospital’, *The Times*, 23 January 1963.

<sup>87</sup> Holford Archives, University of Liverpool, dated 5 July 1963.

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*Figure 24: St Thomas's Hospital, London, rebuilding scheme, William Howitt, 1956–63. View of east wing. (Photo: Jonathan Hughes.)*

ensuing press criticism of the confusion eclipsing the completion of the first and only phase of Howitt's design (Figure 24).

### **Postscript**

By the time of the completion of St Thomas's East Wing, British hospital designers were widely adopting the “matchbox on a muffin” as an appropriate form for the modern hospital. The relative press silence which greeted the completion of the East Wing is perhaps as revealing as the criticism which was aimed at New Guy's House, and highlights the legibility of the programmatic and stylistic differences between the two projects. The “matchbox on a muffin”—and the social, medical and architectural cross-currents which informed its design—had been rapidly naturalized as a rational solution to the needs (both aesthetic and clinical) of the post-war hospital, and was to remain an influential model of hospital design well into the 1960s, even as dissenting voices were beginning to question the inflexibility of the solution, with its reliance on high-tech transportation systems and its inability to accept incremental expansion and change. Whereas verticality and mechanization had underwritten the “matchbox on a muffin”, subsequent models would propose horizontal and low-tech modes of circulation and, out of necessity, came to offer the dominant principles for hospital design in the capital- and energy-starved 1970s and beyond. Yet during the late 1950s

*Jonathan Hughes*

and early 1960s, in an era of self-conscious social and physical modernization, with an optimistic attitude to technology and progress, hospital authorities, designers and the public could briefly agree that the “Dream Hospital” was indeed a “matchbox on a muffin”.