50
YEARS
of the
NATIONAL
HEALTH SERVICE ESTATE
in
WALES
1948 - 1998

Written by Delme Griffiths
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PREFACE

The creation of the National Health Service in 1948 was to change fundamentally the whole concept of hospital provision in the United Kingdom. This book attempts to record how the estate of health care buildings in Wales has evolved over the fifty year existence of the National Health Service. Due consideration is given to those aspects of history that largely determined the origins of the hospital buildings inherited by the NHS in 1948.

The book describes many of the various factors that have influenced the formation of the hospital estate in Wales to the present day. It is not intended to be other than a superficial history of health care development within the NHS. Likewise it describes those changes in the structure and organisation of the NHS in the Principality over the fifty years inasmuch as they have affected the estate. A chapter is devoted to representative examples of specialised estate work inherent in hospitals.

The Welsh health estate is considered as a whole. Many hospitals are listed as buildings of special historical or architectural interest and a number have an association with notable and interesting personalities from the past. For example, the connection of the explorer and journalist Sir Henry Morton Stanley with the hospital which bears his name in St Asaph is relatively well known. Perhaps less so is the fact that Florence Nightingale once failed to obtain a post at Swansea General Hospital.

The many former mansion houses that later became hospitals have similar associations. Craig-y-Nos Castle in the upper Swansea Valley, once home to the operatic diva Adelina Patti, was to become a hospital bearing her name. A lesser known example is Garth Angharad Hospital near Dolgellau, at one time home to Admiral Sir James Saumarez, one of Nelson’s captains at the battle of the Nile. Felix Mendelssohn Bartholdy is said to have composed “The Rivulet” on his visit in 1829 to Coed Du Hall near Mold, a house that was also visited many years later by the author Charles Kingsley, where he frequently walked along the leet and, perhaps, found inspiration for “The Water Babies”. It is outside the scope of this book to record the history of individual hospitals but such instances are typical of the many that illustrate the historic interest intrinsic to a number of buildings that were eventually to be used for health care and have passed into and in some cases subsequently out of the NHS estate.
ACKNOWLEDGEMENTS

No book of this nature can be written without the assistance of a number of persons and it is my wish to acknowledge all the help that has been willingly given.

A special word of thanks is due to Jim Cook who first had the idea for such a book. Without his encouragement and support it would not have been written. When the proposal was first discussed little did we visualise the extent of the eventual outcome. Indeed it was only due to his conviction that my efforts would not be too presumptuous, that I was persuaded to proceed.

In the shaping of the book I have amassed more debts of gratitude than can be adequately expressed here. Particular thanks are due to David Wade for his indefatigable work in locating documents and photographs, to Peter Wiles for his tireless work in preparing the text for publication and to Gary Hyatt for providing access to a number of historic health service documents. Collectively they have also been of immense help in providing suggestions for improving and editing the text. Thanks are also due to Joanne Westall for her initial typing of the manuscript.

I wish to record gratitude to the Librarian of the Bro Taf Health Authority for providing access to those records remaining at the Temple of Peace and Health in Cardiff, and to the Librarian of the Institute of Health Service Administration for access to their library collection. Thanks are also due to many former colleagues of Welsh Health Estates who have provided information and photographs, and to the Directors of Capita EC Limited for allowing use of photographs from their pre-privatisation collection. Last but not least my thanks to my wife Barbara for her support in living with ‘the book’ over a number of months and for being the uncomplaining first reader of every written word.

I am indebted to everyone whose help and support has enabled me to complete the task. Any errors of fact or omissions are, of course, my entire responsibility. My contribution will have been worthwhile if, as a result of this book readers will feel that they have some understanding of the work of NHS estate officers and of how Welsh health care buildings originated and have developed over fifty years in the NHS.

Delme Griffiths
August 1998

CHAPTER 1
INTRODUCTION

On the 5th July 1998, fifty years elapsed since the inception of the National Health Service. Conceived at a time of severe economic depression, gestated in the dark days of total war, and born in the austerity of the post war years, the NHS was unquestionably a major social reform. The concept of a comprehensive all-embracing health service under the direct control of Central Government and paid for by taxation, was visionary and deeply rooted in the social failings increasingly evident during the first four decades of the twentieth century. In an era that has seen many changes in social policy, the National Health Act of 1946 must rank as one of the most important items of social legislation, comparable with such examples as universal suffrage, National Insurance legislation and the 1944 Education Act.

The National Health Act aroused considerable opposition, partly because of the medical profession’s deep suspicion that it would become, to some extent, servant of the state and partly due to the vigorous political will of the government of the day, epitomised by Aneurin Bevan as Minister of Health in driving the bill through Parliament.

The impact of the reform was immense and immediate. Many of the aged and children in particular, obtained much needed treatment which previously they had not been able to afford. The immediate cost of the NHS was far greater than anticipated and this was to have a significant impact during the early years of the service. In the long term, however, the NHS was to improve greatly the general health of the population.

The principles of the NHS are manifested in a comprehensive range of health services, available to all and free of financial barriers at the point of treatment. They have achieved admiration far beyond the confines of the United Kingdom. In terms of the amount of suffering alleviated and well-being created, it has touched, in some way, all the people of Britain. There can be very little doubt that the NHS, whatever its perceived imperfections, is unique in public esteem and many would claim it to be deeply cherished in the social conscience of the British people.

Much has already been written about the social and political history of health care and many admirable and detailed histories of individual hospitals have been recorded. On this 50th anniversary the intention of this publication is to present an overview of the Welsh hospital estate, including its development and maintenance, over the last

6 WELSH HEALTH ESTATES

WELSH HEALTH ESTATES 7
fifty years and to commemorate its contribution to health care, without which the NHS could not have been sustained.

During the fifty years, a number of structural changes have altered fundamentally the way the estate is owned, managed and developed. The 1973 National Health Service Reorganisation Act resulted in radical changes to the administrative structure within which medical care had been delivered since 1948. These included the dissolution of the Welsh Hospital Board and the subsequent fragmentation of its pivotal role in planning both the development of new hospital buildings and major improvements to the existing estate stock. Commencing with the 1973 Act and extending through further changes, management of the maintenance function in hospitals has in turn passed from Hospital Management Committees, to Area Health Authorities and subsequently to NHS Trusts.

Recent years have seen the transfer of the design function in respect of new health care buildings, from the NHS in Wales to the private sector. Further changes are likely with the advent of devolution of governance to the Welsh Assembly. It remains to be seen within which management framework those all-Wales estate services provided by Welsh Health Estates as part of the Welsh Health Common Services Authority, will continue.

It is equally important to recognise that building and engineering maintenance functions, inherent in complex hospital buildings, have also been subject to change in recent years as the use of external contractors continues to replace directly employed skills.

Finally, within the past five years ownership of the NHS estate, albeit still in the public sector, has been conveyed from the Secretary of State for Wales to the individual NHS Trusts.

It is therefore singularly appropriate, at this time, to record the development of the physical aspects of the hospital estate from the stock inherited in 1948 through to the present day. It is also opportune to recognise that the work of many officers of the architectural, engineering and building professions as well as the skills of countless artisan staff, has made an essential and immeasurable contribution to health care through the design, improvement and maintenance of the buildings and equipment.

THE HISTORICAL PERSPECTIVE

The wide variation of hospital buildings received by the NHS in 1948, was the direct result of influences that had moulded the changes in health and social conditions in Britain over the previous 150 years. Much of that legacy remains to the present day notwithstanding immense achievements in building new hospitals. An understanding of the initial problems of the infant NHS and, indeed, of its subsequent development over fifty years, cannot be complete without an appreciation of the salient features of those hospitals that existed prior to the inauguration of the Service. The background reasons for their provision and organisation were to have long lasting effects on what was to come thereafter.

Simply to say that prior to 1948 development had been haphazard and disorganised is to underestimate the situation. The 1944 Ministry of Health White Paper *A National Health Service* described it succinctly as "...a complicated patchwork pattern of health resources, a mass of particular and individual services evolved at intervals...and for the most part coming into being one by one to meet particular problems, to provide for particular diseases or particular aspects of health or particular sections of the community".

Hospitals had developed as independent units not necessarily related to local needs or established in all areas requiring hospital services. Considerable deficiencies and lack of uniformity existed in the quality of health care provided. Very little co-ordination existed between various local authority and charitable health organisations, leading to inefficiency in the use of resources. Financial barriers to treatment remained, despite the provision of the national insurance general practitioner service and the availability of voluntary provident and contributory schemes. Such then were the major inadequacies that provided impetus for reform, reorganisation and eventual expansion which, between 1920 and 1944, found expression in the activities and reports of various bodies of opinion concerned with health.

The changes in public social attitude, evident in the later war years and the immediate post war period, provided a climate favourable to reform. The 1942 Beveridge Plan for social security had already expressed the need to establish a comprehensive health service, to ensure the availability for every citizen of "...whatever medical treatment required,
in whatever form required, domiciliary or institutional, general, specialist or consultant". The subsequent 1944 White Paper A National Health Service was published against a background of general acceptance of the need for such a service if not on the form it should take.

Before 1948 there were, broadly speaking, two distinct types of hospital: those provided by independent public charitable or provident contributions known as the voluntary hospitals, and those provided by local municipal authorities.

**VOLUNTARY HOSPITALS**

For the whole of the nineteenth century, and well into the twentieth, voluntary hospitals instituted by independent charitable organisations, provided by far the greatest contribution to the general hospital treatment of the acute sick. The majority were founded during the nineteenth century, some earlier and a few had mediaeval or monastic origins. Such hospitals varied greatly in type, standards and size, ranging from the largest that had developed in towns and cities to the small cottage hospitals of the rural towns and smaller industrial areas. By 1939 there were approximately 1,120 voluntary hospitals in the United Kingdom; less than 100 had more than 200 beds and over half had less than 30 beds.

Many, if not all hospitals came into existence in a small way and many of those in the rural outlying districts remained small until 1948. Perhaps it is not surprising that the largest hospitals grew in the more metropolitan areas of population and that these attracted the centres of medical learning. Apart from the notable exception of the Hammersmith Hospital in London, all medical schools were associated with and attached to voluntary hospitals.

Prior to the 1914–1918 war most voluntary hospitals depended wholly on charitable donations and endowments. Thereafter this was to change with the growth of regular contributions based on voluntary insurance schemes, and payments from public municipal authorities for work done on their behalf. In particular, some voluntary hospitals in industrial districts were founded and supported entirely by regular contributions from workers within local industry.

By 1948 more than half the income of voluntary hospitals came from sources other than charitable donations, but development was severely restricted by lack of funds and many of these hospitals remained too small to be economic and efficient.

**MUNICIPAL HOSPITALS**

The Public Health Act of 1875 gave power to local sanitary authorities who were the forerunners of county borough, borough and urban and rural district councils, to provide hospitals for the general sick. In fact very few did so before 1930. Until then, apart from the accommodation for mental health, provision by local authorities was restricted to infectious diseases, tuberculosis and maternity requirements. Apart from the voluntary hospitals, almost all public acute hospital provision existing prior to 1930 had its origins in the infirmary accommodation of the Poor Law institutions.

**POOR LAW INSTITUTIONS**

The 'old' Poor Law established under the Act of 1601 had provided for the relief of abject poverty within each ecclesiastical parish through the collection of the Poor Rate by the Parish Vestry. Administration of relief was the civil responsibility of the Overseers of the Poor appointed on a rotational and voluntary basis by the Parish Vestry and enforced by the
Justices of the Quarter Sessions. The duties and costs were generally unpopular, particularly amongst the middle and yeoman classes on which the burden largely fell. The 1832 Royal Commission of investigation into the Poor Law led to the Amendment Act of 1834, and the formation of larger Poor Law authorities by the union of parishes under the administration of Boards of Guardians. Workhouses were thereby established less as a result of a wish to improve the condition of the poor but more to reduce the burden of cost inherent in the Poor Rate. The effect of the ‘new’ Poor Law was drastic. Poor relief at £7 million in 1831 was reduced to below £5 million by 1851. Undoubtedly the Act achieved a reduction in the cost of the Poor Rate while promoting, if not compelling, the ethos of hard work amongst working men and their families if they were to avoid the hardship and shame of the workhouse. The price was misery for a generation of the poor at a time when nearly 20% of the population were paupers. Workhouse inmates were expected to work for their keep and, under the principle of lesser eligibility, to experience if not suffer conditions below that of the lowest in the working classes. Boards of Guardians were empowered to employ paid staff namely Masters and Matrons, Medical Officers and Clerks.

Not surprisingly poverty and illness were companions within the social conditions of the time. Areas of the workhouses were utilised for the treatment of the destitute sick. The increasing proportion of the sick and disabled among the inmates led to a greater regard for their accommodation and medical and nursing care. As the nineteenth century progressed and more particularly after the Sanitary Act of 1866, separate infirmaries were increasingly established. With time, their standards improved, the range of medical treatment widened, the interpretation of destitution became more flexible and the poor law aspect diminished.

The gap between demand for acute hospital care in the general community and the ability of voluntary hospitals to meet it widened. After 1910 increasing use was made of poor law infirmaries as general hospitals for the public but patients remained technically paupers. Boards of Guardians were slow to modernise their buildings which were mostly old and unsuitable. Several Boards, recognising the public preference for voluntary hospitals, granted them monetary aid for the treatment of the poor sick. Boards of Guardians continued to be concerned with sickness as an aspect of poverty so that acute illness was less their problem than chronic infirmity.

The Local Government Act 1929 brought an end to the Poor Law and the abolition of Boards of Guardians. From April 1930, their functions, property and officers were transferred to the county and county borough councils. The workhouses became Public Assistance Institutions. At the same time the Ministry of Health urged local authorities to appropriate suitable poor law hospitals as general acute hospitals, with the intention that the provision of hospitals under the arrangements for the poor should cease. Municipal Hospital treatment would thus be available to all otherwise than by poor relief. Authorities were slow to implement this intention so that most Public Assistance Institutions remained as such until 1948, with the exception of those with established infirmaries designated by local authorities as acute, chronic, and in a few cases, maternity hospitals.

The term chronic sick applied to those patients who, while not requiring the facilities of an acute hospital, did need medical care for prolonged and often progressive illness. Local Authorities were obliged to assume responsibility, invariably through their public assistance arrangements. There was a tendency to utilise accommodation inferior in structure and inadequate in arrangement and amenities for such use, accommodation that often remained tainted by memories and reminders of the workhouse.

The Maternity and Child Welfare Act of 1918 and the Public Health Act of 1936, empowered but did not oblige local authorities to provide maternity hospitals. Many did so, including borough and district councils, with the result that numbers of relatively small maternity homes as well as facilities in local authority general hospitals, were provided in the years to 1939.
ISOLATION HOSPITALS: THE SPECTRE OF EPIDEMICS

Little had been done to isolate cases of infectious diseases until the mid-nineteenth century except, in a limited way, as part of the poor law provision. During the eighteenth century smallpox and typhus had succeeded the plague as the main causes of epidemics. It was the four major Asiatic cholera outbreaks between 1831 and 1866, with a total death toll in excess of 330,000 people, however, that led to movement in sanitary improvements and public health legislation. Although the Sanitary Act of 1866 had empowered local authorities to provide isolation hospitals, they were mostly inactive in this respect. Progress was slow and not until after the Isolation Hospital Acts of 1893 and 1901 were isolation hospitals built in large numbers. These were mostly small and, not surprisingly, built away from centres of population. They were to be a significant part of the hospital stock available in 1948.

Prior to 1912 very little provision had been made for the hospital treatment of tuberculosis except for that available in poor law institutions for some cases of the pulmonary form and in voluntary hospitals for non-pulmonary cases. Treatment for tuberculosis became one of the benefits of insured persons under the National Insurance Act of 1911. The Act also made provision for financial grants towards the cost of erecting sanatoria, and all forms of tuberculosis were for the first time made notifiable.

The initial response came from voluntary agencies of which the Welsh National Memorial Association (WNMA) was a notable example. Not until the 1921 Public Health (Tuberculosis) Act was a statutory duty placed on county and county borough councils to provide adequate arrangements for treatment in clinics and sanatoria. By 1948 there were over 650 such institutions in England and Wales, approximately two thirds provided by local authorities and the remainder by voluntary bodies.

FROM LUNATIC ASYLUMS TO MENTAL HOSPITALS

The public establishment of lunatic asylums (as then described) had developed extensively during the second half of the nineteenth century, under the control of Justices of the Peace acting through the Quarter Sessions. The 1808 Asylums Act had empowered but not compelled every Shire County to provide an asylum for pauper lunatics. Few did so prior to the Asylums Act of 1845 which made the provision of county asylums compulsory. Eventually such responsibility was passed to the county and county borough councils, by the Lunacy Act 1890. The traditional attitude to insanity, coupled with the need for economy, resulted in the building of relatively huge institutions, housing large numbers of patients and remote from centres of population. Such asylums were regarded essentially as places of detention, filled with chronic cases often on transfer from poor law workhouses, with little done by way of treatment. Admission was based on medical certification to which was added the stigma of pauperism since any person whose keep depended on the public rates became, de facto in law, a pauper.

New attitudes to treatment eventually resulted in the Mental Treatment Act of 1930. The asylums were renamed mental hospitals with the facility for early treatment, and housing both temporary and voluntary patients admitted without certification. The poor law stigma was removed although numbers of mental patients continued to be housed in Public Assistance Institutions.

In 1948 nearly 150,000 patients were densely housed in just over 100 large mental hospitals in England and Wales. Under the Mental Deficiency Acts between 1913 and 1938, statutory provision was made for the care of mental defectives (later termed mentally subnormal). County and county borough councils were required to provide suitable care either through voluntary establishments or by direct provision of accommodation. By 1948 institutional provision was available for approximately 50,000 mentally subnormal patients in England and Wales, over half provided directly by local authorities.

Such then were the factors that influenced the hospital estate inherited by the National Health Service in 1948. The position in Wales had no great exceptions in this respect other than, perhaps, the Welsh National Memorial Association organisation for the treatment of tuberculosis.
A TRADITION OF CARE

The historic and folk annals of Wales include a tradition of medicine and treatment of the sick. The celebrated Laws of Hywel Dda (c900-950), ruler of all Wales at that time, laid down payment for the care of the sick and placed physicians high in precedence at his court. The Meddygon Myddfai (c1200-1730s), legendary physicians of Carmarthenshire, although having origin in folk myth, are real enough in the traditions of treating sickness. The oldest records of lay medical practitioners at Newborough in Anglesey, date from c1350, and the earliest surviving medical manuscripts in Welsh are said to be by Bened ap Rhys (Bened Feddyg c1475), of Clwyd. Welsh doctors are said to have been favoured at the court of the Tudors; Lewis of Caerleon was physician to Henry VII in about 1495, and the first medical books written in English for the literate lay person were published in the 1540s by Thomas Phaer, a physician and lawyer of Cilgerran, Pembrokeshire.

The mediaeval monastic abbeys and priories of the Principality are likely to have been active in providing hospice care of the sick and maimed, although no modern day hospitals can be said to have direct connection with such early origins. A small number of hospitals are, however, located at or very near to the sites of former priories.

VOLUNTARY HOSPITALS TAKE THE LEAD

Wales had been agrarian in economy for centuries before the industrial revolution in which it was to play an early and active part. Industry was to give rise to the growth in urban communities through the movement of population. It was to be this industrialisation together with a gradual improvement in the economy of the country linked to a rise in humanitarianism, that led to the demand for institutional treatment for the sick. Progress towards public hospitals was extremely slow. Voluntary effort, as opposed to the limited activity of local government bodies, was to set the pace. The first small voluntary hospital in Wales was opened in Swansea in 1817, later to become the Swansea General Hospital, St Helens Road. Similar voluntary hospitals were opened in Cardiff in 1837 and in Newport in 1860, which would eventually become the Cardiff Royal Infirmary and the Royal Gwent Hospital respectively.

It is not surprising that the larger coastal port towns of industrial South Wales, with their growing populations, should be the centres of early progress. These hospitals, established in the county boroughs, were to grow steadily to a size of over 200 beds enabling reasonable specialisation in diagnosis and treatment in the years immediately prior to entry into the NHS. By 1948 those in Swansea and Cardiff had accommodation well in excess of 300 beds. The hospital in Cardiff had become the clinical centre of the Welsh National School of Medicine which would eventually be the foundation of the University Hospital of Wales.

Voluntary hospitals were gradually established in many of the industrial towns and areas and also in the county towns, with the main expansion taking place in the forty years between 1890 and 1930. Most of these hospitals started in a small way, almost half having less than thirty beds. Many were to remain small, especially those serving rural communities and often described as cottage hospitals. By 1948 voluntary
hospitals with over 100 beds had been established in many of the larger towns and centres of industry.

The voluntary hospitals of Wales were truly charitable in that they were founded and maintained by voluntary contributions and many admitted the poor acute sick without charge. Almost all, while retaining their original character and continuing to derive funds from all kinds of donations, became increasingly dependent on regular contributory funds and payments by patients for treatment and accommodation.

One particular feature of many hospitals located in the mining, quarrying and metal working industrial areas of Wales, was that from their inception they had been fully or partly contributory, admission for free treatment being restricted to those making regular weekly contributions. Those working within a particular industry and with a common means of obtaining a living, naturally developed a sense of close knit community spirit. This, when allied to trade unionism having a strong and active interest in social conditions, resulted in workers wanting to provide their own hospitals within their own locality, easily accessible to them and their families and financed from their own pockets.

Hospitals not immediately recognisable by name as being workmen’s in origin included Blaina and District, Abertillery and District and Maesteg and District. It should also be remembered that the regular pennies of the workers were to be a major source of funding for almost all the voluntary hospitals established in Wales, including the one teaching hospital in Cardiff. Institutions such as the Royal Hamadryad Seamen’s Hospital, Cardiff and the Stanley Sailor’s Hospital, Salt Island, Holyhead, were originally established to provide care for sick sailors in seafaring areas. The voluntary movement also included The Prince of Wales Orthopaedic Hospital, The Walk, Cardiff, founded in 1917 as a hospital for soldiers and sailors who had lost limbs in the Great War 1914-1918.

In all, 73 voluntary hospitals were established in Wales in the years to 1948, just under half having less than thirty beds and almost all housed in buildings erected between 1850 and 1930. Of these hospitals, 71 entered the NHS in 1948.

PRE 1948: VOLUNTARY HOSPITALS IN WALES

<table>
<thead>
<tr>
<th>Type</th>
<th>1 - 30 beds</th>
<th>31 - 100 beds</th>
<th>101 - 200 beds</th>
<th>Over 200 beds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Acute</td>
<td>32</td>
<td>28</td>
<td>8</td>
<td>3</td>
<td>71</td>
</tr>
<tr>
<td>Chronic</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Maternity Only</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>ALL</td>
<td>34</td>
<td>28</td>
<td>8</td>
<td>3</td>
<td>73</td>
</tr>
</tbody>
</table>

MUNICIPAL HOSPITALS FOLLOW ON

GENERAL ACUTE HOSPITALS

The emergence of municipal general acute hospitals in Wales presents a somewhat complex picture. Local authority hospitals included a mixture of those conceived and developed mainly between 1900 and 1940 as acute and maternity hospitals, those converted wholly or partly from former workhouse
infirmaries and Public Assistance Institutions, in addition to a large war
time emergency hospital and two relatively modern hospitals built in the
late 1930s.

The Welsh local authorities established as many as eleven
maternity hospitals between 1944 and 1948. This rapid increase in
provision within a relatively short period of time is very likely (0 have
been in response to demand resulting from the post-war increase in the
birth rate. Each of these maternity hospitals, except one, had less than
thirty beds.

Worthy of particular note as an example of a war-time emergency
hospital was the government owned Morriston Hospital, Swansea,
administered by Swansea Corporation. Having a nominal wartime
capacity of 600 beds in 15 long Nightingale type wards, it was
recommended that this be reduced from 40 to 30 beds per ward in peace
time use. In latter years this hospital was to achieve a deserved repute as
a centre of medical excellence notwithstanding its temporary origins.

The Llandough Hospital (345 beds), Penarth, built in 1937, and
the Church Village Hospital (310 beds), Pontypridd, built in 1940, were
both described in 1944 as "...modern, well designed and efficient hospitals".

Eight other local authority hospitals providing a mixture of acute,
maternity and chronic sick accommodation, had been converted from

PRE 1944: MUNICIPAL HOSPITALS FOUNDED AS
ACUTE AND MATERNITY

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lydia Beynon, Maternity, Newport</td>
<td>Monmouthshire County</td>
</tr>
<tr>
<td>Lord Pontypridd, Dulwich House, Cardiff</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Barry Accident and Surgical</td>
<td>Barry Town</td>
</tr>
<tr>
<td>Lady Aberdare Maternity, Mountain Ash</td>
<td>Mountain Ash Urban District</td>
</tr>
<tr>
<td>Llwynypia, Glamorgan</td>
<td>Glamorgan County</td>
</tr>
<tr>
<td>Maternity Home, Maesteg</td>
<td>Maesteg Urban District</td>
</tr>
<tr>
<td>Fairwood, Swansea</td>
<td>Swansea County Borough</td>
</tr>
<tr>
<td>Graig House Maternity, Swansea</td>
<td>Swansea County Borough</td>
</tr>
<tr>
<td>Rhianfa Maternity, Swansea</td>
<td>Swansea County Borough</td>
</tr>
<tr>
<td>West Glamorgan County, Neath</td>
<td>Glamorgan County</td>
</tr>
<tr>
<td>Ruabon Maternity</td>
<td>Denbighshire County</td>
</tr>
<tr>
<td>Catherine Gladstone Maternity, Mancot</td>
<td>Flintshire County</td>
</tr>
<tr>
<td>Morriston Emergency, Swansea</td>
<td>Swansea County Borough</td>
</tr>
<tr>
<td>Church Village, Pontypridd</td>
<td>Glamorgan County</td>
</tr>
<tr>
<td>Llandough, Penarth</td>
<td>Cardiff City</td>
</tr>
</tbody>
</table>

MUNICIPAL MATERNITY HOSPITALS
ESTABLISHED 1944 - 1948

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Snatchwood House, Pontypool</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Gwaunfarren House, Merthyr Tydfil</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Stouthall, Reynoldston, Gower</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Glasfryn, Llanelli</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Gors, Holyhead, Anglesey</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Ty Nanney, Tremadoc</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Chatsworth House, Prestatyn</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Colwyn Bay Maternity</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Trevalyn Manor, Rossett</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Barmouth Maternity</td>
<td>Cardiff City</td>
</tr>
<tr>
<td>Llandudno Maternity</td>
<td>Cardiff City</td>
</tr>
</tbody>
</table>

The Genesis of Hospitals in Wales
former poor law infirmaries or were closely associated with the sites of such institutions. All, with the exception of the Regent House Infirmary, Chepstow, would enter the NHS.

PRE 1948: MUNICIPAL HOSPITALS FOUNDED AS POOR LAW INFIRMARIES

<table>
<thead>
<tr>
<th>Location</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regent House Infirmary, Chepstow</td>
<td>Monmouthshire County</td>
</tr>
<tr>
<td>Woolston House, Newport</td>
<td>Newport County Borough</td>
</tr>
<tr>
<td>Monmouthshire County, Griffithstown, Pontypool</td>
<td>Monmouthshire County</td>
</tr>
<tr>
<td>County Infirmary, Tredegar</td>
<td>Monmouthshire County</td>
</tr>
<tr>
<td>Mid Glamorgan County, Bridgend</td>
<td>Glamorgan County</td>
</tr>
<tr>
<td>Aberayron Cottage</td>
<td>Cardiganshire County</td>
</tr>
<tr>
<td>County Maternity, Aberystwyth</td>
<td>Cardiganshire County</td>
</tr>
<tr>
<td>County, Bangor</td>
<td>Caernarfonshire County</td>
</tr>
</tbody>
</table>

Forty-eight poor law workhouses had been built in Wales by 1871 and those remaining in use under local authority control, had since 1930 been designated as Public Assistance Institutions. Many had been renamed in a manner that helped to obscure their poor law origins, while some had been described as social welfare homes since the public still retained a sensitivity to the connotations of pauperism. By 1948, approximately 30 such institutions still remained as PAIs, used mainly for the chronic sick but also, perhaps surprisingly, having widespread partial use as local authority maternity accommodation. These buildings were amongst the oldest remaining in use for health care. Almost all had been described in the 1944 hospital survey as unsatisfactory for housing the sick and regarded as unsuitable for conversion to hospitals. Although a number were disclaimed by the NHS in 1948, many were retained and were to be extended and improved as hospital accommodation in subsequent years.
**PUBLIC ASSISTANCE INSTITUTIONS RETAINED BY THE NHS**

<table>
<thead>
<tr>
<th>PAI AND AUTHORITY</th>
<th>NHS HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRECON</td>
<td>Breconshire County St David's</td>
</tr>
<tr>
<td>KNIGHTON</td>
<td>Radnorshire County Knighton</td>
</tr>
<tr>
<td>CITY LODGE</td>
<td>Cardiff City St David's</td>
</tr>
<tr>
<td>TYFILL LODGE</td>
<td>Merthyr Tydfil County Borough St Tydfil's</td>
</tr>
<tr>
<td>CENTRAL HOMES, PONTYPRIDD</td>
<td>Glamorgan County Graig</td>
</tr>
<tr>
<td>TAWE LODGE</td>
<td>Swansea County Borough Mount Pleasant</td>
</tr>
<tr>
<td>LLANELLI</td>
<td>Carmarthenshire County Bryntirion</td>
</tr>
<tr>
<td>PRIORY MOUNT, HAVERFORDWEST</td>
<td>Pembrokeshire County Priory</td>
</tr>
<tr>
<td>CARTREE, PWWHELPE</td>
<td>Caernarfonshire County Pwllheli</td>
</tr>
<tr>
<td>ST ASAPH</td>
<td>Flint County St Asaph General</td>
</tr>
<tr>
<td>DOLGELLAU</td>
<td>Merioneth County Llwynview Institution</td>
</tr>
<tr>
<td>LLYS EDNYFED, PENRHYNDEUDRAETH</td>
<td>Merioneth County Bronygarth</td>
</tr>
<tr>
<td>CAE HEN, FODEN</td>
<td>Montgomery County Brynhafri</td>
</tr>
<tr>
<td>THE LODGE, CAERSWS</td>
<td>Montgomery County Llys Maldwyn</td>
</tr>
<tr>
<td>VALLEY, ANGLESEY</td>
<td>Anglesey County Valley</td>
</tr>
<tr>
<td>ST MARY AND DOLWAEN, CONWAY</td>
<td>Caernarfon County Conway</td>
</tr>
<tr>
<td>CAERNARFON</td>
<td>Caernarfon County Eryri</td>
</tr>
<tr>
<td>WREXHAM</td>
<td>Denbigh County Groesnewydd</td>
</tr>
<tr>
<td>HOLYWELL</td>
<td>Flint County Lluesty</td>
</tr>
</tbody>
</table>

**INFECTIOUS DISEASES HOSPITALS**

By far the greatest investment in health buildings made by local authorities, if measured simply by the total number built or converted, was in the field of infectious diseases hospitals. This development was, however, comparatively late in the historical context of disease epidemics. Smallpox is first recorded as having struck in Wales in 1705, killing around 60 people at Penmachno in Gwynedd. Further outbreaks occurred in 1722 with the death of 70 people in Caernarfon, and in 1762 in Holyhead where 20 people died. Between 1726 and 1730 a widespread typhus outbreak occurred and hundreds are said to have died throughout the Principality. In 1865, fifteen people died of yellow fever at Swansea in what is claimed to be the only outbreak of the disease ever to occur in Britain. Asiatic cholera was also a considerable threat. Between the first cholera epidemic of 1832 and the fourth and last in 1866, 6,500 people died as a result of the disease throughout Wales.

Lack of hygiene and insanitary conditions were to prevail throughout most of the 19th Century. Inevitably the threat of infectious diseases was greatest in the port towns through foreign contacts, and in the areas of population congestion within industrial urbanisation.

In 1848, George Thomas Clarke of Tal-y-garn, Glamorgan, (later managing trustee of the Dowlais Iron Works, Merthyr Tydfil and friend of Sir Josiah John Guest), in an article for the Westminster Review on the sanitary conditions in the Merthyr district, wrote: "The interior of the houses is, on the whole, clean...It is those comforts which only a governing body can bestow that are here totally absent...The drainage is very imperfect; there are few underground sewers, no house drains, and the open gutters are not regularly cleaned out...the refuse is thrown into the streets...The houses are badly built...whole families being frequently lodged – sometimes sixteen in number - in one chamber, sleeping there indiscriminately...the supply of water is deficient...The colliers are much disposed to be clean and are careful to wash themselves in the river...there are no water pipes. In some of the suburbs the people draw all their supply from the waste water of the works, and in Merthyr the water is brought by hand from springs...or lifted from the river...always charged with the filth of the upper houses and works...". Conditions in Merthyr were not greatly improved until after the last cholera epidemic in 1866.

It was gradually realised as part of the sanitary movement, that dirt and filth, poor water supplies, and insanitary conditions, were directly implicated in the spread of certain diseases even if the causative agents could not be identified or the microbiology of infection understood. Thereafter conditions were slowly improved and diseases were finally eradicated as the causes of contagion became better understood and addressed.

Between 1890 and 1910, during which the great majority of isolation hospitals were provided, enteric fever, scarlet fever and diphtheria were the diseases of most public concern. By 1939 the need had again changed. Most enteric fever cases were now of the milder paratyphoid type and scarlet fever, although not less common, was regarded as less serious in character. Diphtheria was to remain a major...
problem until the effects of immunisation prevailed. Smallpox continued to be feared in its most virulent form. Although major outbreaks were not considered likely, the expense of providing hospitals, even though these were small in size, was clearly considered an insurance against the spread of the disease. This was with some justification, since as late as 1962 seventeen people died in the last smallpox outbreak in South Wales, before the disease was eradicated on a world-wide basis.

By 1948, of the 57 isolation hospitals existing in Wales, 42 had 30 beds or less and 13 of these were identified as specifically for the isolation of smallpox cases. While many isolation hospitals were soundly built and in good condition, some were of a temporary nature. Almost all were small and many, of necessity, so removed from centres of population that it was difficult to use them for any other hospital purpose. Two of these hospitals, namely the Cardiff City Isolation Hospital, Lansdowne (City of Cardiff Corporation) and the Hill House Isolation Hospital (Swansea County Borough) did, however, accommodate over 100 beds each. A little over half the total number were either destined never to enter the NHS in 1948 or were to be discarded soon after.

**MENTAL HEALTH HOSPITALS**

Mental health legislation enacted between 1845 and 1930 ensured that, by 1936, the local authorities in Wales had established twenty five hospitals for the care of the mentally ill and handicapped. The largest of these by far were the County Asylums, purpose built in the latter half of the nineteenth century as a result of the Asylums Act of 1845. In common with all other Victorian county asylums, these were designed as large, self-contained, self-sufficient communities, at locations which emphasised the isolation of the inmates from society as a whole. All housed over 1000 patients each.

**MID 19TH CENTURY COUNTY ASYLUMS**

<table>
<thead>
<tr>
<th>ASYLUM AND COUNTIES</th>
<th>HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENBIGH</td>
<td>Merioneth, Caernarfon and Denbigh</td>
</tr>
<tr>
<td>PEN-Y-VAL, ABERGAVENNY</td>
<td>Hereford, Radnor and Brecon</td>
</tr>
<tr>
<td>GLANRHGYD, BRIDGEN</td>
<td>Glamorgan</td>
</tr>
<tr>
<td>CARMARTHEN</td>
<td>Carmarthen, Cardigan and Pembroke</td>
</tr>
<tr>
<td>PARC GWYLLT, BRIDGEN</td>
<td>Glamorgan</td>
</tr>
</tbody>
</table>

The county asylums were generally soundly built with extended lands that contained either a home farm or large kitchen gardens. Designed at a time when the emphasis was on confinement rather than treatment, wards were usually large with commensurate ablation areas. Although the main corridors were mainly wide and long, the buildings were like rabbit warrens in the complexity of inter-ward and inter-floor connections. Cell like rooms were much in evidence within wards.
The early institutions, of necessity, had their own utilities. All had large kitchens and food storage areas, large laundry facilities, and steam raising boiler houses. Most had their own water supply with both reservoirs and source catchment areas. Almost all had the necessary facility and plant for the treatment and disposal of sewage. Many eventually had the capacity for electrical generation by steam engines, first for lighting and thereafter for power, as electricity came into common use. While some of the institutions were connected eventually to the network of public utilities, as these became available, many were to remain self contained. At least one is known to have retained its own electrical generation, with no link to the public national grid supply, until as late as the 1970s. The Joint County Asylum at Carmarthen, built in 1865, is said to have had, at one time, its own coal-gas producing retorts.

Further large mental institutions were to be established before the late 1930s. These were to follow the general design pattern and layout of the early asylums, demonstrating little innovation or progressive thinking in the care of mental illness. None had less than 400 beds.

**MENTAL HOSPITALS WITH OVER 400 BEDS ESTABLISHED 1900–39**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint County Asylum, Talgarth</td>
<td>Brecon, Radnor and Montgomery Counties</td>
</tr>
<tr>
<td>Cardiff City Asylum, Whitchurch</td>
<td>Cardiff City Corporation</td>
</tr>
<tr>
<td>Ely Hospital, Cardiff</td>
<td>Cardiff City Corporation</td>
</tr>
<tr>
<td>Hensol Castle Hospital, Pontyclun</td>
<td>Glamorgan County</td>
</tr>
<tr>
<td>Cefn Coed Hospital, Swansea</td>
<td>Swansea County Borough</td>
</tr>
<tr>
<td>St Cadoc's Hospital, Caerleon</td>
<td>Newport County Borough</td>
</tr>
</tbody>
</table>

One interesting estate aspect of the Cefn Coed Hospital, Swansea, is the high water storage tower built to match the red-brick architecture of the hospital. The hospital is built on high ground to the north-west of Swansea at a point where the public water supply is at minimum pressure. To ensure sufficient pressure head across the hospital, the mains supply is pumped to storage tanks at the top of the tower which remains a landmark seen on the skyline for miles around the Swansea district.

The mental hospitals established at Llwynview Institution, Dolgellau; Brynhyfryd Hospital, formerly Cae Hen PAI, Forden, near Welshpool and Llysmaldwyn Hospital formerly the Lodge PAI, Caersws, were founded on former poor law work-houses. These are among the oldest hospital buildings in the Principality. Brynhyfryd Hospital is of particular interest since it has its origin in the Forden House of Industry opened in 1795. A relic of the old poor law, this is an example of the joint effort by overseers of the poor for a number of parishes, including some from over the border in Shropshire, combining to build an institution pre-dating by nearly forty years the legislation that established work-houses.
All the remaining mental hospitals in general, provided for mental deficiency. All were founded after 1900 and were comparatively small in size, none having more than 130 beds. Almost all were based on converted mansion houses and their estates.

<table>
<thead>
<tr>
<th>Type</th>
<th>1 - 30 beds</th>
<th>31 - 100 beds</th>
<th>101 - 200 beds</th>
<th>Over 200 beds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Acute</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Maternity Only</td>
<td>17</td>
<td>1</td>
<td>-</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Mainly Chronic</td>
<td>-</td>
<td>6</td>
<td>1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>42</td>
<td>13</td>
<td>2</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>PA Institutions</td>
<td>6</td>
<td>17</td>
<td>5</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Mental Health</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>ALL</td>
<td>70</td>
<td>45</td>
<td>16</td>
<td>25</td>
<td>156</td>
</tr>
</tbody>
</table>

Many municipal, general and chronic sick hospitals, and PAIs, provided accommodation for more than one type.

THE ROLE OF THE WELSH NATIONAL MEMORIAL ASSOCIATION

THE FIGHT AGAINST TUBERCULOSIS

In 1911 Lloyd George, then Chancellor of the Exchequer, referred to "...the terrible scourge of consumption..." when announcing, under the terms of the National Insurance Act, the Government's intention to make finance available to combat tuberculosis. Long recognised as a significant cause of death, the pulmonary form of the disease often had tragic consequences when contracted by young people. The concern was such that in September 1910 a national conference was convened to inaugurate a campaign in Wales with the objective of treating and eradicating the disease. As a consequence, the King Edward VII Welsh National Memorial Association (WNMA) was founded and incorporated by Royal Charter in 1912. The Association was to have a very successful and unique role in providing a total of eighteen tuberculosis hospitals and sanatoria in the years to 1936.

Although before 1921, it had not become compulsory for local authorities to make provision for the treatment of tuberculosis, those in Wales were able to make use of the WNMA in a way that was to be a unique example of co-operation and joint action between voluntary and municipal bodies. The wording of the contract of agreement between the WNMA and the various county and county boroughs, is worthy of note. That with the Swansea County Borough, in 1916, is a typical example "...in which the Association agrees to carry out the prevention, treatment and abolition of tuberculosis...in the County Borough of Swansea". The unrealistic expectations of this type of contract, drawn up prior to the advent of penicillin and antibacterial therapy, probably explain why it was rendered obsolete by the High Court in 1930.

The Association was active in establishing hospitals in properties that were originally mansion houses or large country dwelling houses and their estates, modified for sanatorium purposes usually by the addition of purpose built ward units. The WNMA also acquired former infectious disease hospitals and at least three former poor law institutions, deemed suitable for satisfactory conversion to tuberculosis hospitals. The
The provision of purpose built hospitals by the Association reached a zenith in the design and construction of Sully Hospital, Penarth. Completed in 1936, it was described by the medical officers of the 1944 hospital survey as "...being admirably designed and suited for its purpose, attractive to the patients and convenient for the staff." In 1934, the WNMA was party, with the Corporation of the City of Cardiff, the Right Honourable David Baron Davies of Llandinam, and the League of Nations Union, to the founding of the Temple of Peace and Health in Cathays Park, Cardiff.

The WNMA could provide impetus and organisation at a national level in direct contrast to the fragmentation of effort evident elsewhere within general hospital services. The co-ordination of tuberculosis hospitals under the management of the WNMA, was conducive to the economic use of resources, and in many ways prescient of a health service organised from national level. The development of a centrally administered estate which employed both a Supervisory Engineer and Clerk of Works, for example, illustrates this point. Furthermore, leases and purchases of land and property made by the Association, illustrate how investment could be made in an efficient manner, calculated to be beneficial over a large area of population. Examples of these are found in the following table:

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>DATE</th>
<th>COST</th>
<th>TRANSACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Llangefni, Anglesey</td>
<td>July 1913</td>
<td>£117 &amp; 5 shillings</td>
<td>Purchase of land from Sir Richard H Williams Bulkeley</td>
</tr>
<tr>
<td>Cymla, Neath</td>
<td>1913</td>
<td>£500</td>
<td>Purchase of former infectious diseases hospital from Neath Rural District Council</td>
</tr>
<tr>
<td>South Wales Sanatorium,</td>
<td>September</td>
<td>£15,600</td>
<td>Purchase of Mansion House, Farm, and 372 acres of land from Arthur Stuart Williams, Esq</td>
</tr>
<tr>
<td>Talgarth, Brecon</td>
<td>1913</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Wales Sanatorium,</td>
<td>December</td>
<td>£4,350</td>
<td>Purchase of land from Col. Henry B Hughes and the Representative Body of the Church of Wales.</td>
</tr>
<tr>
<td>Llangwyan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brymbo, Caernarfon</td>
<td>April 1914</td>
<td>£2,000</td>
<td>Purchase of Grounds, Gardens, Greenhouses, Plantation and Pigsties, from Laura Jane Jones of Colwyn Bay.</td>
</tr>
<tr>
<td>Montgomery County Infirmary</td>
<td>November</td>
<td></td>
<td>Lease of Newtown Institute for 999 years at a yearly rent of a peppercorn.</td>
</tr>
<tr>
<td>Tregaron</td>
<td>December</td>
<td></td>
<td>Lease for 99 years from the Guardians of the Poor of the Union of Tregaron.</td>
</tr>
<tr>
<td>Pontar, Merthyr Tydfil</td>
<td>1914-23</td>
<td>£5,000</td>
<td>Lease and subsequent purchase from the Guardians of the Poor, Merthyr Tydfil Union.</td>
</tr>
<tr>
<td>Adelina Patti,</td>
<td>March 1921</td>
<td>£1,900</td>
<td>Purchase of Craig-y-Nos Castle and Estate of 48 acres from Baron Cederstrom.</td>
</tr>
<tr>
<td>Upper Tawe Valley</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sully</td>
<td>July 1930</td>
<td>£9,900</td>
<td>Purchase of 160 acres at Hayes Farm, from Dinam Estates, and 4 acres from the Great Western Railway Company.</td>
</tr>
</tbody>
</table>

The WNMA was also active in respect of conversions and improvements within its development of the estate, and as could be anticipated of such an organisation, its transactions contained numerous examples of expenditure on early X-ray equipment and installation.

Respiratory tuberculosis made massive demands in terms of institutional care that was not to reach a peak until the early 1950s. The WNMA had made an outstanding contribution to the fight against a disease of forbidding menace, and was to bequeath to the NHS an administration of hospitals that presaged much of the organisation to come. It was to be the NHS that would benefit from the profound improvements in morbidity and mortality rates of tuberculosis, made possible by the advance in antibacterial drug therapy.
THE GENESIS OF HOSPITALS IN WALES

WNMA EXAMPLES OF ESTATE EXPENDITURE

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>DATE</th>
<th>COST</th>
<th>IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Wales Sanatorium, Llangwyfan</td>
<td>July 1914</td>
<td>£31,453</td>
<td>Contract for erection of hospital</td>
</tr>
<tr>
<td></td>
<td>July 1914</td>
<td>£967 &amp; 5 shillings</td>
<td>Installation of steam boiler plant.</td>
</tr>
<tr>
<td>Tregaron</td>
<td>March 1915</td>
<td>£1,090</td>
<td>Structural alterations and repairs to Tregaron Workhouse.</td>
</tr>
<tr>
<td>Sealyham, Wolf’s Castle, Pembrokeshire</td>
<td>July 1921</td>
<td>£3,379</td>
<td>Conversion to a hospital of Sealyham House.</td>
</tr>
<tr>
<td></td>
<td>May 1922</td>
<td>£1,171</td>
<td>Work on water supply and reservoir.</td>
</tr>
<tr>
<td></td>
<td>August 1939</td>
<td>£303</td>
<td>Supply and installation of Electric Light, 1 1/4 hp horizontal single cylinder cold starting crude oil engine.</td>
</tr>
<tr>
<td>Kensington, St Brides Pembrokeshire</td>
<td>1931</td>
<td>-</td>
<td>Transfer of two 12 kW electric generating sets (dated 1923) and equipment from Cefn Mably Hospital.</td>
</tr>
<tr>
<td>Adelina Patti, Penycae, Upper Tawe Valley</td>
<td>June 1931</td>
<td>£539 &amp; 15 shillings</td>
<td>Supply delivery and erection of necessary steelwork for verandahs and balconies.</td>
</tr>
<tr>
<td>Machynlleth Chest</td>
<td>January 1930</td>
<td>£193 &amp; 11 shillings</td>
<td>X-Ray Room and Dark Room.</td>
</tr>
<tr>
<td>Llangefni</td>
<td>January 1930</td>
<td>£280</td>
<td>X-Ray Equipment.</td>
</tr>
<tr>
<td>Brynseiont</td>
<td>December 1931</td>
<td>£277</td>
<td>X-Ray Room.</td>
</tr>
<tr>
<td>Adelina Patti, Machynlleth Chest</td>
<td>July 1936</td>
<td>£278 &amp; 7 shillings</td>
<td>X-Ray Equipment.</td>
</tr>
</tbody>
</table>

WNMA HOSPITALS AND SANATORIA

<table>
<thead>
<tr>
<th>BEDS</th>
<th>1 - 30 beds</th>
<th>31 - 100 beds</th>
<th>101 - 200 beds</th>
<th>Over 200 beds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

THE NHS LEGACY

The institutions recognised as being provided for public health care purposes became available for use by the NHS from July 1948 and totalled 247. While some were disclaimed, 210 were to be retained by the Service.

The range of building type, construction and state of repair reflected the very wide differences in source, age and location of these institutions. This variation would influence and play a considerable part in the work of the NHS estate over the following fifty years.

AGE PROFILE OF HEALTH CARE BUILDINGS IN 1948

<table>
<thead>
<tr>
<th>TYPE</th>
<th>PRE 1850</th>
<th>1850-1900</th>
<th>1901-1930</th>
<th>1931-1948</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUNTARY</td>
<td>5</td>
<td>33</td>
<td>34</td>
<td>1</td>
<td>73</td>
</tr>
<tr>
<td>MUNICIPAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Acute and Maternity</td>
<td>5</td>
<td>12</td>
<td>12</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>3</td>
<td>20</td>
<td>32</td>
<td>2</td>
<td>57</td>
</tr>
<tr>
<td>Former Poor Law Institutions</td>
<td>22</td>
<td>19</td>
<td>1</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>Mental Health</td>
<td>5</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>WNMA (Tuberculosis)</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>ALL</td>
<td>44</td>
<td>104</td>
<td>89</td>
<td>10</td>
<td>247</td>
</tr>
</tbody>
</table>

Based on age of oldest original building at site of hospital.
The commencement of the National Health Service came at a time of severe economic difficulty. For those unable to remember the immediate post-war years it may be difficult to appreciate the exceptional austerity endured by people during that period. 1948 was the ninth consecutive year of economic harshness and restriction. Basic foodstuffs such as, bread, meat and potatoes, continued to be rationed at a level even more rigorous than during the war years. The winter of 1947 had been one of exceptional severity, producing the most heavy and prolonged snow and bitter cold experienced within living memory. The resulting transport difficulties produced a scarcity of fuel which was already in short supply. The hard winter followed by a dry summer gave rise to a poor harvest throughout Europe, resulting in a steep increase in the price of food and the cost of animal feed. Building materials were already scarce at a time of considerable demand for post-war reconstruction. Government priorities of necessity favoured the construction of new houses and schools. Not surprisingly, the allocation of both material resources and finance for expenditure on hospitals was severely curtailed. All these effects combined to ensure that at the time the NHS emerged, hopes for a material expansion of health care were destined to be dashed. That postponement was to last the greater part of a decade.

The structure of the NHS in England and Wales was based on fourteen regional hospital boards, thirty-six boards of governors of teaching hospitals, and 388 hospital management committees. This was reflected in Wales (including Monmouthshire) by the creation of the Welsh Regional Hospital Board, the Board of Governors of the United Cardiff Hospitals, and Hospital Management Committees that would eventually total twenty-two in number.

The Principality had first been regarded as an entity for the purpose of health care administration by the formation in 1912 of the Welsh National Memorial Association for the treatment of tuberculosis. This entity had been strengthened in 1919 by the creation of the Welsh Board of Health representing the Ministry of Health in Wales. The wartime Emergency Hospital Service which involved some national control of resources, had also treated Wales as a region for this purpose. However, the creation of a Welsh Region in terms of the NHS, could not be regarded as a foregone conclusion. For the purposes of the 1944 hospital surveys, the six Counties of North Wales had been included in the survey of the North West centred on Liverpool and Manchester. The surveying officers indicated some ambivalence in their recommendation that the North Wales Counties be associated with a region centred on Liverpool. Viewed over fifty years on, there is some irony in the evidence received in the survey and quoted as follows: “There is acute division of opinion in the county as to whether it should form part of the region based on Birmingham or of that based on Liverpool. Those who favour the association with Liverpool lay great stress on the importance of the Welsh language and say that many of the Liverpool consultants are Welshmen and Welsh-speaking; they also dwell on the traditional association of North Wales with Liverpool... There seems to be no disposition to favour association with Cardiff... owing to Cardiff’s inaccessibility... Bangor is not regarded as suitably situated to be a centre for the whole of North Wales”. The surveyors did, however, suggest that their proposed general plan for North Wales, be applicable whether or not the whole of Wales was treated as a single administrative unit.

The one specific requirement of the Health Service Act in relation to establishing regional hospital areas, determined that, as far as practicable, each area and board should be associated with a school of medicine. The Welsh National School of Medicine, situated in Cardiff, met this criterion. The decision that there be a Welsh Region and Board prevailed, the proposal having been put within the consultation process prescribed by the Act, without giving rise to any great measure of contention.

The Board, consisting of 32 members, was to have Sir Frederick Alban, CBE, LL.D, as its first chairman. This was a particularly appropriate appointment in view of his service as Secretary of the Welsh National Memorial Association since 1916. It was also appropriate that the Board established its headquarters at the Temple of Peace and Health, Cathays Park, Cardiff, in the building that the WNMA had been instrumental in establishing in 1934.

The permanent staff organisation of the Board was to be based on five main executive divisions – Medical, Secretariat, Treasurer’s, Architect’s and Engineer’s. The officers of these divisions constituted a multidisciplinary team that could provide the variety of skills necessary for carrying out the functions of the Board. All these divisions through their role in the planning and supervision of the hospital service, were to play an immense part in the development of the hospital estate. By 1950,
the first Architect and Engineer to the Board were in post. D. Garbut Walton, FRIBA, was to serve as Architect until 1970, and H.R.H. Ward, AFC, BSc, AMIMechE, AMIEE, was to serve as Engineer until 1965.

The allocation of hospitals into groups, each of which would be administered by a hospital management committee (HMC), was an early task that fell on the regional boards, but subject to final approval by the Minister of Health.

The initial guidance issued by the Ministry, had the conceptual basis of providing a reasonably comprehensive range of hospital services to groups of the population which formed natural identifiable catchment areas. This was to be no easy task in Wales, where the population distribution was markedly uneven, partly due to the physical geography of the country, partly due to historical and past political events and very largely due to the economic conditions of industry and employment. The sparsely populated hinterland of mid-Wales and more especially the counties of Brecon and Radnor, posed a particular difficulty in that it was impossible to achieve a balance between the provision of a range of hospital services and the distribution of a small population within such a large geographical area.

Although the functional grouping of hospitals was not in accord with the basic concept, due to extended catchment areas, large hospital size and particular administrative needs, it was decided that hospitals for the mentally ill and mentally handicapped would “...for the time being...” be grouped together to form mental health HMCs. It is interesting to note that the Board also proposed one further functional HMC based on all the tuberculosis sanatoria and hospitals, thus preserving the unity of the WNMA institutions. The Minister of Health was, however, to decide against this option, preferring the treatment of tuberculosis to be undertaken within the scope of general hospital groups.

At its inception, the NHS in Wales was to have a total of twenty one HMCs, made up of fourteen general catchment area groups and seven mental health groups. The transfer of the Miners’ Rehabilitation Centre at Talygarn, Glamorgan, to the NHS, in 1951, under the terms of a government agreement with the Miners Welfare Commission, created a further single unit HMC. Other than for a small number of hospital transfers between groups, the initial disposition of HMCs was to remain unchanged until 1963.

Prior to the inception of the NHS, each hospital had its own system for building and engineering maintenance. Municipal hospitals and institutions were able to obtain maintenance services from the Architect’s or Engineer’s Department of the local government authority. Voluntary hospitals often received advice and assistance from local architectural, surveying and consulting engineering practices in addition to building and engineering contractors who might be members of the governing hospital committee. This custom was often in accord with the charitable foundation of many of these hospitals. Many of these institutions contained extensive engineering installations including steam boiler plant, steam pressure vessels and distribution systems associated with heating, kitchen and laundry plant and, in some cases site electrical generation. As a consequence of the immediate nature and often acute effect of engineering breakdown on day-to-day functions, as well as the technical responsibility arising from relatively complex engineering systems, many hospital authorities had appointed a technical officer or engineer-in-charge and a small team of engineering tradesmen.

In general, external advice and assistance diminished with the advent of the NHS, and HMCs looked to the technical officer to take overall responsibility for both engineering and building maintenance. Such officers were technically qualified mainly by training in industry with a steam raising and pressure vessel tradition, were usually very experienced and often more than adequately acquainted with the maintenance of building fabric. In some cases, HMCs inherited in addition to engineering staff, a small team of building tradesmen and labourers for both maintenance and minor capital works; in other cases a small nucleus of building maintenance staff had to be appointed.
Early national guidance established the post of Group Engineer (later Superintendent Engineer) to take responsibility for engineering services at Group level. It defined the officer's post as being “…fully and directly responsible to a Hospital Management Committee or Board of Governors”. Hospital Engineers (later Senior Engineers) and Assistant Engineers could be appointed, as appropriate, at individual hospitals or sub-groups of hospitals. The employment of a Building Foreman was advocated where the Group utilised a direct labour team for building works. He would be responsible to the Superintendent Engineer who reported to and advised the HMC on both engineering and building matters. By 1952, the post of Group Clerk of Works had been given official recognition but restricted to larger groups where there was already an officer on the Engineer’s staff carrying out such duties. This post was given the title of Building Supervisor by formal recognition in 1956. Although the majority of engineers in the health service held nationally recognised technical qualifications, the Tyler report of 1962, reporting on the work, grading, training and qualifications of hospital engineers, recommended minimum qualifications in each grade. By 1965 the recommendations had been introduced and Superintendent Engineers were once again re-designated as Group Engineers and the title of Hospital Engineer re-introduced. A similar process in respect of Building Supervisors was to await the recommendations of the Woodbine Parish Report published in May 1970.

Broadly speaking, the determination and review of the estate maintenance policy of each HMC was conducted through a Works or Buildings and Grounds Sub-Committee. Where, as was usually the case, the Superintendent/Group Engineer was recognised as a chief officer, he would attend such a Committee. Eventually the Building Supervisor would also achieve this status.

At the appointed day in July 1948, the Welsh Regional Hospital Board accepted responsibility for an estate of 210 hospitals and approximately 5000 acres (2025 hectares) of land mainly held under freehold tenure. The land holding included approximately 1300 acres (526 hectares) of agricultural land, much of which was rented out under tenancy agreements. In addition, the estate included a variety of clinics and numerous units of residential housing for health care staff. Worthy of note in terms of what may now be regarded as peculiar and even humorous, are examples of the oddities, agreements and restrictions found in the leases and deeds of conveyance of the estate. These often arose from the origins of the land and buildings. For example, it was not unusual to find district hospitals, particularly those founded on large dwelling houses gifted or sold for the purpose, having a restriction against use for the treatment of infectious or contagious illnesses.

### EXAMPLES OF ESTATE AGREEMENTS

<table>
<thead>
<tr>
<th>Estate Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aberlillery and District Hospital</td>
<td>If hospital is sold, money to go to Trust Fund on behalf of the inhabitants of Mynyddislwyn Parish (hospital in Llanhilleth Parish).</td>
</tr>
<tr>
<td>Royal Hadaedryad Hospital</td>
<td>Leasehold land just above High Water Mark of Medium Tides. Deed of Gift of Taff Vale Railway Company on Lease for 999 years from 1905 (land is returnable to Trustees on closure of hospital).</td>
</tr>
<tr>
<td>Gelligaer Hospital</td>
<td>Minerals reserved by National Coal Board but Minister has option to purchase mineral rights on decision to work mine under hospital. Failure to use option restricts claim for damage from subsequent subsidence.</td>
</tr>
<tr>
<td>Hill House Hospital</td>
<td>No title deeds but part of Swansea Corporate Estate under provisions of an Act of 1761.</td>
</tr>
<tr>
<td>Montgomery County Infirmary</td>
<td>Grazing tenancy of land. Minister reserves timber and game. Tenant not allowed weaning ewes, calving cattle or bulls on the land. Tenant to cut thistles and clear moles.</td>
</tr>
<tr>
<td>Stanley Sailors Hospital</td>
<td>Land owned by British Railways Board, Salt Island. If use of land to the north of hospital becomes intolerable lease can be terminated on giving six months notice.</td>
</tr>
<tr>
<td>Flint Cottage Hospital</td>
<td>If property is sold, money to go toward the poor people of Flint.</td>
</tr>
<tr>
<td>Chirk Cottage Hospital</td>
<td>Right of entry into hospital land reserved by vendor for game shooting.</td>
</tr>
<tr>
<td>Llangollen Hospital</td>
<td>If use as hospital discontinues for more than six months, premises to revert back to donor or his heirs.</td>
</tr>
</tbody>
</table>
Also of interest was the estate of Kensington Hospital, on St Brides Bay, Pembrokeshire, which had the advantage of including three estate cottages and a large Beach Hut, let as holiday accommodation between April and September each year to members of the hospital service. Staff of the Board and of the HMCs were to take advantage of this amenity over many years. The cost at one time is quoted as 4 guineas per week for up to two persons and 1 guinea for each additional person up to four. The Beach Hut was cheaper at 3 guineas but much in demand being just above the high tide line.

From the outset the task facing the Board was immense. Two causes of concern were immediately apparent and were clearly problematic areas: the poor quality and unsuitability of a large proportion of hospital buildings and the considerable need for increased bed accommodation. North Wales lacked a general hospital of the requisite size and design and South Wales had a high proportion of small hospitals. Much of the acute accommodation had been considered by the 1944 hospital surveys to be “...structurally ill-adapted for the purpose for which it is used...”. While a number of hospitals were described as being suitable to “...be rendered reasonably satisfactory by adaptation and extension...”, it was recognised that such development would not be easy on sites already lacking space and in difficult locations. Many institutions for the chronic sick were considered totally unsuitable for health care purposes. In addition, the war years and their aftermath had ensured that the maintenance of hospital buildings had suffered nearly a decade of neglect. Much of the estate was severely dilapidated. The Board faced the dilemma of so much needing to be done at a time of scarce financial resources. Restricted finance was a state of affairs faced by all Regional Hospital Boards and the Ministry did issue guidance on what should be given priority. Importance was attached to works that would achieve more effective use of existing facilities. A spread of relatively small schemes was undertaken, to modernise essential services such as electrical and mechanical engineering installations including boiler plant, and to convert, adapt and improve out-patient, X-ray and pathological laboratory departments. Accommodation for nurses was also given priority since a lack of nursing staff had reduced the availability of hospital beds. The emphasis placed on such works is reflected in the record of the Board’s contracts for.

[Image: Former Kensington Hospital, St Brides Bay, Pembrokeshire]

[Image: Dilapidations evident in bathroom in a South Wales Valley 's Hospital]

[Image: Dilapidations evident in ward kitchen in a South Wales Valley's Hospital]
1948: THE NHS ESTATE IN WALES – THE EARLY YEARS

This period. It explains, for example, a contract in May 1951, in respect of the erection of a Nurses' Hostel at Parc Beck, Swansea, for the then comparatively large sum of nearly £58,000.

Other major contracts at this time included the provision of ward units totalling 170 beds at Hensol Hospital at a cost of a little over £96,000, two new ward units and nurses' home at Morriston Hospital at a cost of £62,000, and a new operating theatre suite, X-ray department, and new boiler house at Llanelli Hospital at a cost of over £87,000. Two major schemes fell outside the Board's capital expenditure, namely the work by the Board of Governors of the United Cardiff Hospitals to complete a new maternity unit at the Cardiff Royal Infirmary, and the conversion by the Ministry of Works of a former American military hospital at Rhydlafar into the Prince of Wales Orthopaedic Hospital. This latter scheme, the largest and most expensive project of the time, opened in 1953 at a fully equipped cost of a little over £500,000. This hospital would eventually replace the older institutions of the same name at The Walk, Cardiff and Crossways, Cowbridge.

The Board had also commenced work on a Blood Transfusion Centre at Rhydlafar, placing a contract for stage 1 at a cost £16,000 in November 1952 followed by stage 2, at £85,000 in May 1954. Work also proceeded at this time at the site of the Whitchurch Hospital, Cardiff, on a new radiotherapy department that would eventually become the South Wales Radiotherapy Hospital, Velindre.

The largest contract agreed by the Board up to the end of 1954 was for the erection of what was described as a "new hospital for the sick" on the site of St David's Mental Hospital, Carmarthen, at a cost of over £126,000. This has been claimed to be the first new hospital completed by the NHS in Wales if not in the United Kingdom. Although the unit was self-contained, the claim loses authenticity in that it was built within the confines of an existing hospital and had no separate identity. Capital expenditure by the Board commenced at £189,000 in the financial year 1948-49, increased to £337,000 in 1949-50 and was at £561,000 by 1953-54. This was at a time when a new hospital of 500 beds is estimated to have cost in the region of £1m and all schemes over £100,000 required Ministry authorisation.

The total amount spent by the NHS each year on hospital building in England and Wales remained at the same modest level for over six years. The figure for 1949-50 stood at £8.7m and had not increased beyond £9.8m by 1954-55. Indeed, in each year between 1945 and 1962 less hospital construction was undertaken in the United Kingdom than yearly in the decade before the Second World War.

It was clear by the end of 1954 that the Government of the day faced a choice of either increased spending on improving the quality of hospitals or accepting the political responsibility for failing to sustain and develop the National Health Service. Early in 1955 the Ministry of Health announced additional finance for NHS capital works to include the building of new hospitals, major building improvements and the replacement of outdated and deteriorated plant. Money was identified for three financial years ahead, the allocation for England and Wales rising to £13m in 1956-57 and increasing to £18m in 1957-58. By 1959-60, £20.5m was available for capital projects and Regional Boards were further informed that £25.5m and £31m would be allocated in the following two years respectively. This enabled the Board, for the first time since its inception, to plan a programme of hospital improvements over a realistic period of time and commence major new schemes. The Board's expenditure each year on capital works was to grow steadily from £770,000 in 1954-55 to over £1.8m in 1960-61. This period saw the start of progress towards a number of district general hospitals that within three decades would be provided across the Principality. Work had already commenced in 1954 at the site of the new West Wales
The Ministry had always recognised a need for Regional Boards to assign a proportion of resources to the non-acute sectors of the Service and in particular to mental hospitals where overcrowding in older poor quality accommodation gave serious cause for concern. The Welsh Regional Board’s record in this respect, for the period 1948-1957, compared favourably with the national average, with nearly 25 per cent of its total capital spending being allocated to the mental hospital sector.

The first stage of the development of Llanfrechfa Grange Hospital as a mental deficiency unit commenced in 1958, with stage two being completed in 1962, at a total cost of over £500,000. Originally taken over from the local authority as a 24 bed maternity hospital, Llanfrechfa Grange would eventually have over 500 mental deficiency beds. In addition to providing new mental illness accommodation at the North Wales Hospital, Denbigh, Hensol Hospital, Glamorgan, and the St David’s Hospital, Carmarthen, the Board had, during the first decade of operations, also acquired Oakwood Park, Conwy, to provide 187 mental deficiency beds and established the Garth Angharad Hospital, Dolgellau, for the same purpose.
While many factors could affect the ability of the NHS to meet the demands for hospital care, the availability of beds would always be a fundamental requirement. Early evidence on the need for increased numbers of beds had been based on a comparison with what was regarded as the optimum bed/population ratio. However, waiting lists for inpatient treatment, which peaked in 1951, soon became strongly indicative of the need for expansion and the Board became active in taking every opportunity to increase the total complement of beds within the financial constraints that prevailed.

Such was the demand for accommodation that some hospitals established by the Board in the period to 1960 can be regarded as temporary in both layout and construction. For example, Maesgwyn Hospital, Bridgend, and Ystrad Mynach Hospital, Glamorgan, were both based on former war-time miners hostels converted for use as geriatric and chronic sick units.

Military hospitals and sites were acquired, such as the former naval hospital at Pembroke Dock, established in 1958 as the South Pembrokeshire Hospital providing 16 beds in the district and redeveloped by 1961 to provide 83 mainly acute beds. The St Lawrence Hospital, Chepstow, was based on wartime accommodation converted to provide over 150 beds for burns and plastic surgery, the first for this specialty in Wales. Former wartime Nissan hut accommodation was utilised at Glanagwili, Carmarthen, and Withybush, Haverfordwest. Both sites would eventually see the development of large modern hospitals.

The Board also acquired and converted suitable non-hospital buildings such as large dwellings and country houses. Nevill Hall Hospital, Abergavenny, Bryn Beryl Hospital, Pwllheli, Cilmaenllwyd Hospital, Llanelli, and Glyncornel Hospital, Llwynypia, were typical examples of this type of development.

Further extensions and new buildings within the boundaries of existing hospitals, also contributed to increased bed accommodation. By 1958 the peak waiting list for inpatient treatment had been reduced by over a third, which compared favourably with the national average figure.

The increasing diversity of hospital buildings, in type, age and quality of construction, presented no easy maintenance task for the works departments of Hospital Management Committees. These departments were to make an invaluable contribution to the process of adaptation and improvement through the progression of minor capital works by the HMCs. Such work, undertaken by direct labour staff or local contractors, was usually to the design of Hospital and Group engineering and building officers.

The Board as a result of the extensive programme of capital works in excess of 650 contracts up to March 1961, had developed skilled and experienced design teams of architects, engineers and quantity surveyors,
as well as site supervisory staff, all under the leadership of senior professional officers. These teams would become the mainstay of the hospital design capability within the NHS in Wales for almost another forty years.

In 1960 the Board, with the approval of the Minister, had agreed to omit the word 'Regional' from its title which became the Welsh Hospital Board (Bwrdd Ysbytai Cymru). Although the new title could be used for day to day purposes, it did not become recognised, for strict legal matters, until a Private Members Bill became law in 1964.

By 1960 the increase in capital spending on improving the hospital stock was such that the days of patch and make do could be considered to be at an end. The 1956 Guillebaud Report of the Committee of Enquiry into the Cost of the NHS had recommended increased capital funding to over £30m per year for the next seven years. Even so this figure was not to be exceeded in England and Wales until 1961-62.

As early as 1949, the Welsh Regional Hospital Board had identified the need for new hospitals in eight areas of the Principality, with further major building extensions required in as many other locations. The priority within this early assessment had been for new hospitals in Bangor and Cardiff. Although the exercise could be regarded as optimistic since neither finance nor government approval was likely to be forthcoming, this initial planning nevertheless gave root to the eventual development of the teaching hospital in Cardiff. It also indicated the Board’s motivation and willingness to anticipate the arrival of better circumstances.

The plan produced, known as the Review of Proposed Hospital Development, anticipated a need for as many as fourteen district general hospitals of 400-800 beds distributed throughout the Principality on the basis that, as far as possible, patients should not have to travel much more than twenty five miles to a major hospital. It was proposed that this core of major acute hospitals be supported as appropriate by a number of local general practitioner hospitals in addition to the special treatment units, the long-stay hospitals and the one teaching hospital. As ever those parts of rural Wales with low density of population posed the greatest challenge of achieving a balance between patient access within reasonable travel distances and the need for efficiency and economy of scale. In this respect it was agreed to retain some small units in rural areas.

As a result of this anticipatory preliminary work, the Board found itself in an advantageous position when, early in 1961, the Minister of Health, Enoch Powell, called on all Boards to submit plans based on a ten year building programme for new hospitals, to be started up to 1970-71 and completed by 1975. The work already undertaken allowed the
Board to put forward schemes based on a carefully considered and integrated plan for the whole of Wales. These schemes would become listed in the 1962 document *A Hospital Plan for England and Wales*, which envisaged that the hospital programme set out for each region would be reviewed annually so that an assessment of the work to be started over the next ten years would always be available. The plan specified 90 new and 134 substantially re-modelled hospitals to be started by 1970-71. Each regional programme included the effect by 1975 of completed schemes on the provision of beds in relation to local population and on the existing hospitals likely to be closed as a result of the new developments. Also included was a forward assessment, inasmuch as it could be foreseen, of schemes to be undertaken after 1970-71.

The basis of the plan was a concept of district general hospitals each of 600-800 beds serving a population of 100,000-150,000. Few would have less than 300 beds and each would, as far as possible, be in the centre of the population served. The pattern of provision would be based on the detailed plans prepared by the regional boards.

The Hospital Plan would eventually have its detractors but Enoch Powell was not wide of the mark when he stated at its launch that “*the Hospital Plan will determine for many years to come the broad lines of development of the hospital service, and indeed of the Health Service as a whole...*”.

The plan certainly provided the political push essential to obtaining the Treasury finance necessary for any significant progress in the building of new hospitals. Its Achilles heel was that the cost estimates were on the whole far too low and there was a need for realism by correlating scheme costs to available resources. Moreover, the rate at which hospital building could be undertaken depended on a number of factors, not the least of which were the availability of staff qualified to plan and design, the capacity of the construction industry to build and the provision of revenue finance for running the hospitals. It was estimated that the programme of building would add about £10m per year to running costs. The last revision of the plan came in 1966 when it was envisaged that the hospital capital building programme for England and Wales would require £1000m over the following ten years.

The Nuffield Provincial Hospitals Trust had reported in 1955 on extensive research into the functions and design of hospitals. This research was to spur the Ministry of Health into setting up its own small unit to study the planning and design of hospitals. In 1961 the unit was to issue the first of what was to become *a series* of Building Notes. Both the Nuffield studies and the Ministry Building Notes, in particular *Note No 3 – The District General Hospital*, were to greatly influence the planning and design of the new DGHs undertaken by the regional boards.

The district general hospitals planned by the Welsh Hospital Board were to be provided either by completely new building or by phased redevelopment of existing hospitals. Three completely new hospitals were already under construction - the West Wales General Hospital at Glangwili, Carmarthen, the Bronglais Hospital, Aberystwyth, and the Singleton Hospital, Swansea. Work on the Glangwili site had commenced in 1954 and progressed as resources allowed by substantial phases in 1956, 1959 and 1965. Singleton Hospital had been started with an Outpatients Department in 1957 and recommenced in 1963. Bronglais Hospital also started in 1963 followed *rapidly* in the same year by the first stage redevelopment of the Royal Gwent Hospital, Newport. In late 1965 substantial progress was being made in respect of the Dewi Sant Hospital built on the site of the demolished Graig Hospital, Pontypridd and the building of the new DGH at Nevill Hall, Abergavenny, had commenced.
DEVELOPMENT OF THE ESTATE - NEW HOSPITALS

Bronllys District General Hospital, Aberystwyth

Singleton District General Hospital, Swansea - early photograph

Phased development of the Royal Gwent District General Hospital, Newport still showing the original voluntary hospital

The Craig Hospital, Pontypridd - former workhouse and Central Homes Public Assistance Institution

Dewi Sant Hospital, Pontypridd rises from the site of the old Craig Hospital

Prince Charles District General Hospital, Gurnos, Merthyr Tydfil
In 1966 the Board, in common with all regional boards, was required to revise the Hospital Plan against a background that recognised a number of shortcomings in its financial viability. It had become clear that new hospitals providing expanded services and an increased range of specialised treatments, were expensive to run. Revenue resources could not keep pace with new development. Ministry advice indicated that capital programmes should include more schemes with little or no revenue consequences.

It also became clear that very little of the Board’s programme for new hospitals could be completed within the decade to 1975 without substantial phasing of each project. In revising the programme the Board recognised that many of the envisaged district general hospitals, in particular those at Newport, Bridgend, Rhyl, Merthyr Tydfil and Bangor, could only proceed in stages. In the final outcome, further stages of the Royal Gwent Hospital commenced in 1972 and 1974 and main contracts for the Rhyl DGH at Bodelwyddan and the Merthyr DGH at Gurnos were delayed until 1971. Restrictions at the site of the Bridgend General Hospital dictated the need for a re-appraisal and a requirement for a new site. The contract for the Withybush DGH was placed in 1973 but the Bangor DGH at Penrhosgorneudd was not to proceed until 1976.

It is no coincidence that even to the casual observer, the district general hospitals at Rhyl and Merthyr appear to be identical both externally and internally. Since both hospitals were planned to be the same size, it was soon appreciated by the Board, that savings in both design fees and time could be achieved if the same consultant architects, engineers and quantity surveyors were to design the two hospitals on a common basis. After consultation with all local parties, the Board was also able to decide that, as far as possible, a common internal design could also be adopted for both.

An unusual feature of the development of the Royal Gwent Hospital was the siting of a steam boiler plant at the adjacent but separate site of the St Woolos Hospital, to serve both hospitals. Steam supply pipework serving engineering services at the Royal Gwent Hospital run along a walk-through underground duct, passing underneath a public highway and the campus of the hospital. The provision of the boiler house at St Woolos formed an early part of the Royal Gwent Hospital development stage 1 completed in 1966.

As previously referred to, the initial planning of a new teaching hospital in Cardiff had involved the Welsh Hospital Board, the Welsh National School of Medicine and the Board of Governors of the United
Cardiff Hospitals. Construction of the hospital was, however, to become the responsibility of the Board of Governors of the teaching hospital group. The development commenced at the chosen site of Heath Park, Cardiff, where the Dental Hospital and Dental School were opened in 1965. Completion of the main scheme was achieved in 1971 with the opening of the University Hospital of Wales, providing not only a district general hospital of 810 beds but also the first purpose built and completely integrated hospital and school of medicine in the United Kingdom.

Despite considerable difficulties, the Welsh Hospital Board pursued with tenacity a policy of building DGHs as fast as resources would allow, and was able by 1973 to initiate the construction of eight of the district hospitals first envisaged in the assessment made in 1959.

Other major projects undertaken in the decade from 1965, included a psychiatric and geriatric unit at the East Glamorgan Hospital, Pontypridd and a new maternity unit at the Caerphilly and District Miners’ Hospital. Between 1971 and 1974 more than ten geriatric units, usually accommodating thirty patients, were built at various hospitals throughout the Principality. Examples of these are those built at Lluesty Hospital, Holywell, Mardy Hospital, Merthyr Tydfil, Bryn Beryl Hospital, Pwllheli, Towyn Hospital, HM Stanley Hospital, St Asaph and Maesgwyn Hospital, Bridgend.

HOSPITALS FOR MENTAL HEALTH

In the mental health sector, work had proceeded on the Bryn-y-Neuadd Hospital, Llanfairfechan. Originally designed to provide over 500 mental handicap beds, the hospital was completed in 1970 on a site that had, in pre-NHS days, been an annexe of the St Andrew’s Mental Hospital, Northampton.

The 1959 Mental Health Act which radically altered legislation on mental illness, admission and detention, together with advances in effective psychiatric drug therapy, had already outdated the concept of
large mental hospitals. For this reason, the Board was to retain and improve a number of the smaller mental handicap hospitals, in particular those in North Wales due for closure on the opening of Bryn-y-Neuadd.

An enquiry into the Ely Hospital, Cardiff, reported on in 1969, not only resulted in the Board having to survey and reassess the allocation of resources to the long-stay sector, but also had repercussions that would be reflected in national policy. The dispiriting results of the survey led directly to the Charter for the Mentally Handicapped Patient approved by the Board in 1971. At the heart of the Charter lay the principle of providing an improved environment and a living pattern as near as possible to normal life, for all patients and staff in existing hospitals for the mentally handicapped. To further the objectives of the Charter, the Architect to the Board was asked to design new accommodation that should consist of small family-size houses, grouped together in numbers roughly comparable in capacity to old-style thirty-bed blocks. Each house would have eight residents, sleeping in single, double or three bedded rooms. Other main rooms would consist of a Living Room, Dining Room, Kitchen and Utility Room. The houses would be bungalows with provision for physical disability, and should in scale and general appearance, both inside and outside, resemble private dwellings, with each house having its own access. Four such residential units were built between 1972 and 1974, on vacant plots within the boundaries of small hospitals located in areas considered to have the greatest need. Each hospital was within walking distance of, or had easy access to a town. Only one of the hospitals had any previous connection with mental health.
The residential units were to play a significant role in relieving the pressure on the large mental handicap hospitals and in particular Hensol Hospital which by 1970, had over 800 patients. In addition, the Board was able to adapt accommodation becoming available from changes in the morbidity of certain diseases. Accommodation for over eighty patients was provided at Bronllys Hospital, Brecon, the former South Wales Tuberculosis Sanatorium. A further 50 patients were accommodated at The Rest, Porthcawl, a convalescent home the Board was able to lease. In both cases, the principles of the Charter for mentally handicapped patients were met by adaptions to provide the necessary facilities at relatively modest costs.

THE IMPROVEMENT OF EXISTING HOSPITALS

It is to the credit of the Welsh Hospital Board that it maintained progress on the programme for the district general hospitals while meeting the Ministry requirement for a proportion of schemes creating low revenue expenditure. It is against this background that work on major projects in the years after 1960 should not be allowed to overshadow and obscure the extensive work concurrently undertaken by the Board on the general improvement of the existing estate. Such work was now to become far less urgent in nature and more of a planned and measured process. A wide spread of schemes included the improvement of wards and their ancillary rooms, the provision of new operating theatres and X-ray suites, the upgrading of kitchens and laundries and the addition of maternity and geriatric accommodation. The adaptation of wards and, in some cases of entire hospitals, arose from changes in the pattern of need. Extensive upgrading also ensued in building engineering services either as part of new or improved buildings, or as specific...
schemes to reorganise and improve heating systems, domestic hot and cold water services and electrical installations. The electrical work contracted for over this period included the replacement of distribution cables and outdated switchgear, and the completion of conversions to Alternating Current supply at those large mental hospitals where generation and distribution had hitherto been by Direct Current. The third stage of such a scheme was completed at the North Wales Hospital, Denbigh, by late 1971. Other electrical work at this time included the extensive installation of diesel driven emergency generation to cover essential services in the event of failure of the public supply. Much of this plant was provided well before the period in the 1970s when industrial disputes and the 3-day working week gave rise to an acute need. The installation and improvement of fire alarm systems was also an extensive activity that continued throughout the period from 1960 to 1974. One other significant contribution to the adaptation and more effective usage of a number of smaller hospitals, was the provision of lifts either as part of larger schemes or to meet a specific requirement.

Particular mention has to be made at this point, with regard to the level of co-operation achieved between the professional Technical Officers of the Board and the Group Engineers and Building Supervisors at HMCs. The works departments of HMCs made an invaluable contribution to the betterment of the hospital estate through their inception and control of minor capital works that fell outside the scope of normal building and engineering maintenance. Typical of this contribution were small building works, electrical installations and rewiring, installation of domestic water services and the provision of heating systems undertaken either by direct labour staff or by local contractors. Almost all the design work for these smaller schemes was undertaken at group office level. As a general rule, work of a nature that required the use of design consultants would normally be within the purview of the Board.

An important aspect of the co-operation between the Engineer to the Board and the Group Engineers, was in the essential area of boiler and boiler house replacement. The NHS in Wales had inherited in 1948 a variety of steam and low pressure hot water boiler plant of an even greater diversity of age and condition. Most of these boilers were coal fired by hand and the condition of some was such that from the outset, the Board had to consider urgent replacement. In some instances the priority was such that specific boiler house projects had to proceed, but a most effective and frequently used method, even when resources had improved, was to include such replacement within the scope of hospital improvement schemes. This method, linked to a boiler replacement programme that the Board had set in place, ensured that by 1972 only very few steam boilers in the hospitals of Wales pre-dated the NHS. Further reference is made to this programme in chapter eight.

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### NHS WALES 1960-1974: HOSPITALS ESTABLISHED OR RECOMMISSIONED

<table>
<thead>
<tr>
<th>Hospital Name</th>
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<tbody>
<tr>
<td>Bronglais DGH - Aberystwyth</td>
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<tr>
<td>Royal Gwent DGH - Newport</td>
</tr>
<tr>
<td>Nevill Hall DGH - Abergavenny</td>
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<tr>
<td>Bryn Y Neuadd Hospital - Llanfairfechan</td>
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<tr>
<td>Dewi Sant Hospital - Pontypool</td>
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<tr>
<td>The Rest Convalescent Home - Porthcawl</td>
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<tr>
<td>Polish Hospital - Penley</td>
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<tr>
<td>University Hospital of Wales - Cardiff</td>
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### THE RESTRUCTURING OF HOSPITAL MANAGEMENT COMMITTEES

Between 1963 and 1970, a series of changes ensued in the structure of Hospital Management Committees in Wales. The 1962 Hospital Plan initiated a Ministry requirement that the pattern of HMCs be reviewed in order to ensure effective management following the advent of district general hospitals. The Plan also favoured a closer association between psychiatric and acute general hospitals, advocating that the treatment of the mentally ill be regarded as part of main stream health care. As a result of these considerations, a reduction in the number of Welsh HMCs was brought about mainly by the amalgamation of each mental health group with an adjacent group or groups.

From 1 April 1963, the Carmarthen Mental HMC amalgamated with the West Wales HMC to form the South West Wales HMC. By the end of 1963, the Cefn Coed HMC, formerly the Swansea Mental HMC,
had become part of the Glantawe HMC. On 1 April 1965, the Whitchurch and Ely HMC, formerly the Cardiff Mental HMC, became part of the newly formed Cardiff North and District HMC. Also on this date, the Vale of Usk HMC, formerly the Monmouthshire Mental HMC, was dissolved and the hospitals allocated to the Newport and East Monmouthshire HMC and the North Monmouthshire HMC. By this change it is interesting to note that the Llanfrechfa Grange Hospital returned to the purview of the HMC of which it had been part as a maternity hospital in 1948.

In North Wales, the North Wales Mental HMC closed on 31 March 1967, with the hospitals passing to the Caernarfon and Anglesey HMC, the Clwyd and Deeside HMC, and the Wrexham Powys and Mawddach HMC, as appropriate to their location. On 1 April 1969, the Morgannwg HMC, formerly the Glamorgan Mental HMC, amalgamated with the Mid Glamorgan HMC to form the Bro Morgannwg HMC. The last of the mental health groups disappeared on 1 October 1970, when the Welsh Border HMC amalgamated with the Brecon and Radnor HMC to form the Border Counties (Wales) HMC.

The change in the pattern of HMCs was not, however, restricted to the mental health sector. The Rhymney and Sirhowy Valleys HMC was dissolved on 31 March 1965, and the hospitals distributed to neighbouring HMCs. Some of these hospitals would be affected once more when the most complex change of all was to take place in the greater Cardiff area.

There had been for some time a demand that the hospitals in the Cardiff area be managed and planned as a cohesive entity. The Cardiff HMC and the Cardiff North and District HMC (formed in 1965) were amalgamated on 1 April 1969, to form the Cardiff and District HMC, a group that was to have a very short life. Under the terms of the 1946 NHS Act, the United Cardiff Hospitals teaching group had been administered by a Board of Governors directly answerable to the Minister. This aspect of the Act had been a concession arising from the formation of the NHS. By 1968 a new policy of placing such teaching hospitals within HMCs answerable to Regional Boards, was in favour. This was facilitated by the 1968 Health Services and Public Health Act which allowed clinical teaching hospitals to be designated University Hospitals for which a HMC could be formed. In addition in 1969, the Secretary of State for Wales
it is interesting to note that following the serious outbreak of smallpox in South Wales in the early 1960s, the Board modernised part of the St Mary’s Hospital, Penarth, to form a high security isolation unit.

It had become clear that there were advantages in retaining some of the smaller hospitals to serve local communities although not all could be modified for an alternative purpose. Their location, size, structure and condition required consideration in the light of the proposed change of use. Inevitably a number of hospitals were recommended for closure as

<table>
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<tr>
<th>HOSPITALS CLOSED 1948 – 1974</th>
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<tbody>
<tr>
<td><strong>BY 1950</strong></td>
</tr>
<tr>
<td>Bronpadarn Maternity, Aberystwyth</td>
</tr>
<tr>
<td>Cwmclwyd, Swansea</td>
</tr>
<tr>
<td><strong>BY 1955</strong></td>
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<tr>
<td>Amy Evans Memorial, Barry</td>
</tr>
<tr>
<td>Prince of Wales, The Walk, Cardiff</td>
</tr>
<tr>
<td>Miskin Manor Convalescent, Pontyclun</td>
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<tr>
<td>Ty Nanney Maternity, Tremadoc</td>
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<tr>
<td>Rhyl Isolation</td>
</tr>
<tr>
<td><strong>BY 1960</strong></td>
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<tr>
<td>Highland Moors, Llandrindod Wells</td>
</tr>
<tr>
<td>Sandbrook House, Merthyr Tydfil</td>
</tr>
<tr>
<td>Pontsarn Chest, Merthyr Tydfil</td>
</tr>
<tr>
<td>Victoria and Meyrick, Pembroke Dock</td>
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<tr>
<td><strong>BY 1970</strong></td>
</tr>
<tr>
<td>Prince of Wales, Crossways, Cowbridge</td>
</tr>
<tr>
<td>Pantglas Hall, Llanfynydd</td>
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<tr>
<td>Penhesgyn Open-Air, Anglesey</td>
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<tr>
<td>Sealyham, Wolf’s Castle, Pembrokeshire</td>
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<tr>
<td>Bronglas Welfare Home, Aberystwyth</td>
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<tr>
<td><strong>BY 1974</strong></td>
</tr>
<tr>
<td>Lady Aberdare Maternity, Mountain Ash</td>
</tr>
<tr>
<td>Crickhowell War Memorial</td>
</tr>
<tr>
<td>Gelligaer Isolation, Pengam</td>
</tr>
<tr>
<td>Vann Annexe, Caerphilly</td>
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<tr>
<td>Barry Maternity</td>
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unworthy of further investment, the responsibility for the ultimate decision remaining with the Minister or Secretary of State. In Wales thirty-nine hospitals are identified as having closed between 1948 and 1974.

The growth in the NHS Estate Building Programme was largely responsible for the expansion of the Welsh Hospital Board whose headquarters was located in the Temple of Peace and Health in Cardiff. Due to space limitations, design staff found themselves spread over five separate locations in Park Place and Museum Place in Cardiff, in somewhat cramped and unsuitable accommodation. By the end of 1972, the Board had relocated almost all its staff to eight floors of modern office accommodation leased at Heron House, Newport Road, Cardiff. In 1965 the Board had also invested in main frame computer facilities located in a partly prefabricated building at Velindre Road, Whitchurch. This was to remain the computer centre for nearly thirty years.

Before being overtaken by the tide of the 1974 reorganisation of the NHS in Wales, the Welsh Hospital Board placed its last contract in the sum of £183,125 for the erection of a Pharmaceutical Department at the Neath General Hospital.
The establishment of the NHS had created a pattern of administration consistent throughout the United Kingdom, which was to be retained for over twenty-five years. There was, however, continuing concern over the division of the NHS into three parts—the hospitals, general practitioner services, and local authority health services. The path to reorganisation was to become strewn with a plethora of reports and consultative documents. Much was made of the need to unite the branches of health care, based on the premise that the problems the service had encountered hitherto had reflected the compromises made in 1948 and the failure to achieve a fully unified and comprehensive hospital and community health service. It has to be said that the need for an NHS reorganisation was hardly disputed at the time and its eventual format was widely supported, at least initially. The effect of the reorganisation on the NHS, however, is likely to be measured, in years to come, in the light of events that followed up to the present day, events that are still too recent for objective judgement. History will decide whether the extent of the radical changes to the structure of the NHS, that came into effect on 1 April 1974, was either necessary or even desirable. It is significant to note that the pattern of administration was to change twice again within the following twenty-five years.

The consultative process concerning the need for change was protracted, with the publication of two Government Green Papers, one in July 1968, the other in February 1970. A change of Government in June 1970, ensured, however, that a further Consultative Document did not appear until May 1971, which was only issued to interested parties and not officially published. This was to be the basis of the Government’s White Paper, National Health Service Reorganisation: England and its counterpart in Wales, both published in August 1972. The NHS Reorganisation Act 1973 was given Royal Assent on 5 July 1973, exactly twenty-five years after the original founding day. Implementation of the Act on 1 April 1974 was to fall to yet another Government elected in February of that year.

Almost from the inception of the new administrative structure it became apparent that problems would arise in the management implications resulting from the impending changes. These would prompt demand for further changes almost immediately. Preparations for management arrangements had to be expedited in order to meet the appointed date and it was in this respect that discussion and consultation were to prove less than adequate.

The report Management Arrangements for the Reorganised NHS (the Grey Book) and its equivalent for Wales (the Red Book), were published at the end of 1972. Both documents put forward proposals which were the conclusions and recommendations of a Steering Committee and Study Group assisted by McKinsey Management Consultants. The documents appeared to suggest that these proposals could be changed as a result of further discussion with other interested bodies. For Wales, the Red Book was specific—“Subject to these consultations, we have in mind that the Report should provide the framework for guidance from Welsh Office to the new Area Health Authorities, and for the AHA’s themselves to develop detailed proposals for organisation and staffing.” In circumstances of enforced haste, however, the comprehensive proposals of both the Grey and Red Books were widely interpreted as official policy. This was not surprising in view of the detailed description of the proposed hierarchical management arrangements and the generous view of managerial staffing levels compared with those that had existed hitherto in the regional hospital board and hospital management committee structure.

A major feature of the reorganisation in England was a strong regional tier of authority to be responsible for planning, finance and building, with the power to monitor and direct the area health authorities. In Wales, there would be no regional tier interposed between the Welsh Office and the Area Health Authorities who would be the field authorities responsible for managing health services in their Areas. The Welsh Office was allocated the Regional responsibility in addition to the Departmental control already held in a Health and Social Services Department under the overall charge of the Secretary of State for Wales.

Eight Area Health Authorities were created coterminous with the new Welsh County Councils. Five of the AHA’s were to be divided into administrative Districts—Dyfed and Mid Glamorgan into four Districts, and Clwyd, Gwent and West Glamorgan into two Districts. The remaining three AHA’s—Gwynedd, Powys and South Glamorgan—would be constituted as Areas without Districts.
1974: The Restructuring of the NHS - Effect on the Estate

This structure was to have profound implications for the management and development of the health estate, not least of which would be the effective dissolution of the Welsh Hospital Board. Both the 1971 Consultative Document and the 1970 Green Paper had proposed a direct relationship between the Area Health Authorities and the Welsh Office without the interposition of an intermediate all-Wales authority comparable to the regional health authorities proposed for England. In the light of present day constitutional changes, it is interesting to note that suggestions received by the 1969 Royal Commission on the Constitution may have played some part in the decision not to have a regional tier. It was the hope of some that, eventually, there would be some form of elected Welsh Council, having among its functions authority over health care. The report of the Commission in October 1973, however, did nothing to sustain this.

In the meantime, the 1972 White Paper for Wales conceded that there had been debate on the issue of an intermediate all-Wales health authority. In view of the decision that the AHAs should be directly accountable to the Secretary of State, for planning and running their services, it is perhaps not surprising that the White Paper was somewhat light in respect of the counter argument. It was also indicated that the decision was strongly influenced by the transfer in April 1969 of ministerial responsibility for the conduct of the health service in the Principality to the Secretary of State for Wales. It was considered that ministerial concern with and accountability for the service should be closer and more direct than had hitherto been possible under the Ministry of Health (the Department of Health and Social Security from 1968). The thrust of the argument was that ministerial accountability was incompatible with the delegation of central responsibility for overall co-ordination of planning, allocation of resources and for monitoring the performance of operational authorities, to an intermediate health authority. An intermediate tier was recognised to be appropriate for England whereas the omission in Wales was justified on the basis of smaller scale and the perceived problems of blurred and overlapping responsibilities. The Government went some way to indicate that the decision in no way implied criticism of the Welsh Hospital Board. In so doing, a brief tribute was paid to the valuable service the Board had rendered through the energy and dedication of its chairman, members and officers.

It could be argued that the Welsh Hospital Board ceased to exist when at a zenith of ability that was not likely to be immediately duplicated elsewhere. Certainly, given time, both the drive and expertise of the Board could be equated by the bodies now charged with authority to plan and resource the service. However, there were those who seriously questioned, at the time, the wisdom of what had been brought about. History will judge whether the Welsh Office and the Area Health...
Authorities did serve the Principality in matters of health care with a record to equal that of the Welsh Hospital Board and Hospital Management Committees.

It was clear that reorganisation would bring about changes in the role of the Welsh Office, notwithstanding the intention that most of the executive functions of the Health Service in Wales would be delegated to the AHAs. The major tasks of co-ordination and resource allocation, previously delegated to the Welsh Hospital Board, would now fall within the responsibility of the Welsh Office. It was recognised that there remained some largely executive functions of a specialised and technical nature, that would be more effectively and efficiently provided through an all-Wales arrangement but which could not be considered appropriate within the scope of the Welsh Office. These all-Wales functions would include the design and construction of major capital building schemes and associated professional advice, specialised management services such as mainframe computing, central supply and printing services, and prescription pricing. For this reason, the reorganisation included the setting up of the Welsh Health Technical Services Organisation (WHTSO), established under a Statutory Instrument Order of 1973. Thus WHTSO was formed as a body that would serve both the Welsh Office and the AHAs, providing advice in its professional fields whilst having no managerial authority in respect of the functions of the AHAs. In the context of the design and construction of capital building projects, schemes would be designated as delegated for execution by the AHA concerned or non-delegated for execution by the WHTSO. Major building schemes, in particular all new hospital building, reconstruction of existing hospitals, and complex schemes, were regarded as non-delegated.

The delegation of as many functions as possible to the AHAs was clearly a primary objective of the new structure, and included the devolution of planning the development of the service. The AHAs would therefore have a much more substantial management task than had accrued to the former health authorities. To meet these demands, the management structure was based on an Area Team of officers (administrative, medical, nursing and finance) co-ordinated by the Area Administrator and answerable to the Area Authority which consisted of about 15 part-time members including the Chairman. Delegation of day-to-day decisions would be to a District Team consisting of the same four professions with the addition of two clinicians. Health districts did not form a separate formal level of authority, but represented units of administration with delegated management responsibility for the operation of the services. Unlike in England, the District Officers were made subordinate to their Area counterparts.

Management of the estate was vested in the Area Works Officer (AWO) who, as a member of one of the works professions, had responsibility for building and engineering maintenance and for the provision of new building and engineering works, to the extent that these were delegated to the AHA. Although accountable directly to the Authority, the AWO was subject to co-ordination and monitoring by the Area Team. The AWO did, however, have direct access to the Authority on professional and technical matters. Where considered justified by the extent of the District structure or the size and complexity of the Area, provision could be made for the Area Works Officer to be supported by an Area Engineer and Building Officer.

The works functions carried out at Area level included the preparation of planned maintenance programmes and the control and inspection of such work being implemented at District level. The provision of specialist maintenance services in areas such as lifts, electromedical equipment and medical gases, were also seen as an Area function, as did all administrative support work including job costing, compilation of statistics and the maintenance of estate records.

Although the AHAs were responsible for the project planning, design and construction stages of delegated schemes, they were considered too small to support their own design teams of architects, design engineers and quantity surveyors. The design and execution of small, straightforward delegated capital works could, however, be undertaken by capable staff if available at Area level. Where delegated schemes required extensive resources or more complex design, the AHA could engage design consultants or the WHTSO.

Outline proposals for capital projects were developed by each Area Health Authority year by year as part of their rolling service development plans, indicating the priority attached to each project. The Welsh Office co-ordinated these plans into an all-Wales capital programme.
admitted to the programme, each project would be allocated a specific amount of finance. In addition, AHAs would have a small capital allowance for discretionary use on approved minor works. Once priorities and programmes had been agreed between the Welsh Office and the AHAs, schemes to be delegated to each Authority were chosen on the basis of building type rather than cost. The criteria for delegation usually included buildings previously executed by the local authorities, such as health clinics, health centres and ambulance stations. Also included were residential accommodation, administrative accommodation such as offices and stores, and works on existing hospitals involving the addition, upgrading or expansion of single departments or straightforward groups of departments. These criteria were such that, although the majority of schemes in terms of numbers were delegated, the non-delegated schemes represented the bulk of the capital spend. The decision on delegation was the responsibility of the Welsh Office.

Although fully responsible for delegated schemes, the AHAs could seek WHTSO assistance at any or all stages, from project development through to construction. Alternatively, WHTSO could advise on the selection of professional consultants and assist with specialist advice in relation to their services. In the case of non-delegated schemes, WHTSO had the direct responsibility for implementing the later stages of project planning, and for design and construction. Extensive consultation with the AHAs was an essential feature of this process with the object of including client requirements in the design brief.

The operation of the engineering plant, the carrying out of breakdown maintenance and the implementation of planned maintenance programmes, were seen as tasks at District level under the management of a District Engineer and a District Building Officer. These officers were responsible to their Area counterparts and thereby to the AWO but were, however, subject to the co-ordination of the District Team for day-to-day matters. The position of the Hospital Engineer although not directly changed, was now clearly more remote from that of the chief works officer than had hitherto been the case.

The Welsh Health Technical Services Organisation was conceived as a separate entity to carry out specific works functions on an all-Wales basis and was quite different from the Works Departments in Regional Authorities in England. It was based on an agency concept, employed to carry out defined technical and executive functions for clients. WHTSO operated under the direction of a small Board appointed by the Secretary of State. The professional and administrative expertise resided with four officers, namely, the Director of Works, Supplies Officer, Computer Manager and Chief Administrator, each directly responsible to the Board.

The Director of Works had responsibility for the professional estate services provided by WHTSO, and co-ordinated and directed the activities of the three chief officers of the works professions - the Chief Architect, Chief Engineer and Chief Quantity Surveyor, thus ensuring the integration of the building design process. In this respect, the
arrangement followed a similar pattern to the integrated organisation of the works professions in the Regional Health Authorities established in England.

The medical and nursing contribution to the building planning and design process was now to be provided by the Welsh Office and AHAs, as client organisations. WHTSO, however, was required to provide Project Administrators to assist the AHAs in progressing and coordinating building schemes. These Project Administrators were formally responsible to the Chief Administrator.

With the exception of the new post of Director of Works, the management structure of the Works function within WHTSO did not differ greatly from that of the former Welsh Hospital Board. In fact, the three chief professional officers had previously held substantially the same posts in the WHB and project administration had been the responsibility of the Secretary to the Board. Furthermore, the design teams established by the WHB remained substantially intact enabling the seamless transfer of the design capability to the WHTSO. The appointment of the Director of Works was delayed until after the publication in February 1975, of the Cruickshank Report commissioned by the WHTSO. In December 1974, the WHTSO Board had appointed Herbert J Cruickshank, CBE, (already well known for his report to the Department of Health in February 1973, on the Planning, Design and Construction of Hospital Buildings for the National Health Service). He was to report on “...the internal management structure of the Organisation in relation to the capital works and project administration responsibilities...”. The implementation of the recommendations of this report was to influence significantly the future structure of the WHTSO Directorate of Works.

NHS re-organisation as radical as that of 1974 was inevitably complex and progress was protracted. Although shadow health authorities had been in place for up to a year before the appointed day, the process of implementing the management structure took some time to complete with the estate appointments taking a relatively low priority. The appointment of the Area Works Officers and their immediate support staff extended throughout 1974 and beyond.

The reorganisation ensured that the NHS passed through a period of nearly eight years when it could not devote its full energy to normal tasks. Planning and discussion had first been initiated in 1968 and implementation had extended for up to three years beyond 1974. It was inevitable that the service would experience difficulties as a consequence of suffering an upheaval on a scale that not only severed long-standing working relationships but also introduced complicated arrangements not easy to absorb in the short term. During this period and for the first time in its history, the NHS experienced serious staff discontent and strike action. In addition, these years coincided with a worsening of the national economy and a significant slowing down of the rate at which health care expenditure could grow. The Service now faced financial stringency not envisaged when the changes were first planned and which would play a large part in dashing those high hopes with which the reorganisation had initially been supported.
UNDER NEW MANAGEMENT

The detailed elements of the functions and responsibilities between the client bodies of Welsh Office, AHAs, and WHTSO in the post 1974 NHS in Wales, were defined in a number of procedural documents. These required a degree of co-operation in the planning and provision of health service buildings that would prove demanding on all the bodies concerned.

In 1962 the Ministry of Health had prescribed a procedure for the preparation and approval of individual building schemes that had also introduced the principle of cost planning. Considerable experience was subsequently gained in the practical problems of processing schemes, and in particular, their cost control during design. By 1967 the earlier procedure had been extensively revised in a system described as a series of Hospital Building Procedure Notes that became known collectively as Capricode.

In July 1974, the Welsh Office issued Capricode HBPN No 1, Procedure for the Planning and Processing of Individual Building Projects, modified in terms of the reorganisation in Wales and updated with regard to the 1973 Cruickshank Report (not to be confused with the Cruickshank Report in respect of WHTSO). Immediately following re-organisation there was, understandably, an interim period when the AHAs would not yet be in a position to fully accept the responsibilities of preparing Client Briefs and Development Control Plans in respect of individual schemes, as defined in Capricode. It was also essential that cost planning should operate from the outset to reduce the possibility of abortive design and to obtain tenders within budget costs. This demanded a notional statement of the design team’s estimated cost of the scheme proceeding through detailed design, so that total cost could be readily reconcilable with the approved budget cost of the project. Control of both building and engineering costs would require management by a Quantity Surveyor throughout the development of the scheme. It was in the context of Capricode that WHTSO was clearly in a position to assist the AHAs. The accumulated knowledge, skills and experience in health building procedures, acquired as a result of the processing and development of hospitals since 1948, were well established within WHTSO, since reorganisation had brought comparatively little change in the works element inherited from the Welsh Hospital Board. Within the Directorate of Works, three teams had been formed on the basis of North Wales, South East Wales and South West Wales, for the purpose of liaison and provision of services to the Area Health Authorities. Each team consisted of an Architect, Engineer and Quantity Surveyor at the senior level of Assistant Chief, together with a Project Administrator. Regular monthly meetings with each AHA, usually represented by the Planning Officer, Chief Works Officer and also the Medical and Nursing Officers, provided a forum for discussion with regard to non-delegated schemes in the Health Building Programme as well as delegated schemes where WHTSO was involved.

It may be appropriate here to note the cost of the WHTSO operation for the year 1974-75. The funds expended on the services provided by WHTSO and for which the Chief Administrator was the Accounting Officer, amounted to approximately £2.8m, only part of this sum being attributable to the works function. The capital expenditure authorised by Welsh Office, for which the Permanent Secretary was the Accounting Officer, approached nearly £10m. Eighty schemes were under construction on site. A further one hundred schemes had been admitted to the programme and were in various stages of the Capricode procedures. Twenty three schemes had been identified as requiring WHTSO services though not yet within the Capricode stages. Various other services were being provided to clients, sometimes prior to firm schemes being identified as such. In his report of February 1975, on the work functions of WHTSO, H J Cruickshank did not regard this scale of operation to be large in terms of work load but did consider it complicated in terms of managerial control. The salient recommendations of the report were concerned principally with the responsibilities of the Director of Works and how these could be best met given the procedural relationships with the Welsh Office and AHAs. Project Administration was regarded as a function best carried out under the Director and thus part of the responsibility for all works activities. Ensuring the progress of a project was seen as a role for a Project Manager since the Project Administrator, as a co-ordinator, had no authority over other members of the project team. The recommendations
are worthy of mention in as much as they were incorporated into the managerial structure of the Directorate of Works which was otherwise to last without any great change until 1989.

The Cruickshank Report of 1975 was perceptive not only in its analysis of the opportunity to clarify responsibilities within the tripartite arrangements for health care building, but also in identifying the need to allocate management authority in a manner that should tighten procedures, bearing in mind the requirement to shorten long drawn out time-scales of many health care building schemes. This proved particularly perceptive in the light of difficulties that were to follow within the decade.

The Welsh Office issued in May 1973, a guide to planning in the reorganised service. In the area of capital planning, the guide recognised that while a detailed all-Wales capital development programme, based on the annual plans of the AHAs, would eventually be underway, this would be impractical in the immediate future. AHAs would take over a 3 year programme from the local authorities and Welsh Office would inherit from the Welsh Hospital Board a 9 year capital building programme that would, to a large extent, pre-determine what could be done in the years immediately following NHS reorganisation.

PROGRESS IN HOSPITAL BUILDING

Among the first contracts awarded by WHTSO on behalf of the client authorities, were those for the erection of a new accident and emergency unit, and the provision of new boiler plant and diesel generators at the Cardiff Royal Infirmary.

The decade to 1974 had seen construction commence on the sites of no less than four new district general hospitals with the design underway for a fifth. The period from 1974 to 1980 saw further extensive development of accommodation for geriatric medicine including new units at Bryntirion Hospital at Llanelli, Llandough Hospital, Morriston Hospital, Dobshill Hospital in Clwyd and the County Hospital at Pontypool. Further twenty and thirty bedded units of this type were to follow at the Victoria Hospital at Welshpool, Abertillery and District Hospital, Cymla Hospital in Neath, Llwynypia Hospital, the Montgomery Infirmary and Llanidloes Hospital. Geriatric day units were provided at Bronllys Hospital, Talgarth and Nevill Hall Hospital, Abergavenny.

Other major construction contracts commenced at this time included a further ward block and pathology department at the Royal Gwent Hospital, Newport, and a new 48 bed ward block and operating theatre suite at the Maelor General Hospital, Wrexham, where the X-ray department was also extended. A new casualty department and gynaecological unit were provided at Neath General Hospital where further contracts included extensions to the operating theatre suite and X-ray department. A major development including X-ray and operating theatre provision, commenced at the County Hospital, Pontypool and a new ward block was provided at the Denbighshire Infirmary. The laundry facilities were extended at both the East Glamorgan Hospital and the West Wales General Hospital, Carmarthen.

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In the mental health sector, industrial and occupational therapy units were built at the Hensol Hospital, Glamorgan; further residential units for the mentally handicapped were provided at Ystrad Mynach Hospital, and a behavioural modification unit was built at the Broughton Hospital, Clwyd. Developments in the area of specialised treatment included the provision of a burns unit at the St Lawrence Hospital, Chepstow and a major extension of the Velindre Radiotherapy Hospital, Cardiff. Other significant developments towards the end of the period up to 1980, included the conversion of Ruthin Hospital into a Community
Hospital and the provision of an Artificial Limb and Appliance Centre at Morriston Hospital.

In the arena of the new district general hospitals, a contract was placed for residential accommodation at the Withybush DGH, Haverfordwest, one of the three new DGHs under construction at this time, the others being Prince Charles Hospital, Merthyr and Ysbyty Glan Clwyd. In March 1976, the main contract had been placed in respect of the Gwynedd DGH to be built at Penrhosgarnedd, Bangor, followed in October 1978, by the contract for the residential accommodation. This was to be the last DGH of its type based on the conventional hospital design prevailing at the time. Future design was to be founded on the Nucleus hospital concept which, during the 1980s, was to provide the design template that became a prerequisite of the briefs for all future DGHs developed in Wales.

The 1962 Hospital Plan had originally envisaged a network of district hospitals each with 600-800 beds serving a population of up to 150,000. The Bonham-Carter Report published in 1969, was to propose much larger hospitals of 1000 beds and over on the basis of its recommended provision in each medical speciality and what was seen as the economic provision of support services such as pathology, sterile services and laundry. Such a solution did not find Governmental favour. Operational research conducted by the DHSS in the early 1970s, concluded that the economic size was far smaller within a range of 500 to 800 beds, depending on location.

The hospital building programme had, however, provided the opportunity to test new ideas in hospital design. High rise hospitals had, for example, been found to be heavily reliant on lifts that were costly and restricted movement. The concept of Best Buy model hospitals based on compact low-rise buildings, economic to build in a single stage and having a layout where the wards surrounded a central core of departments, proved to be a restricted design that was difficult to expand. Despite the perceived need for the economy of standardisation, most of these were built as one-off hospitals. Most regional hospital board design departments had, however, moved towards their own standard designs. The DHSS was to take up co-ordination of these designs out of which was born the idea of Harness – the harnessing together of standard departments. Jointly developed by the RHBs and the DHSS, Harness aimed to reduce the time taken to build hospitals that, although assembled from largely standard parts, were aesthetically acceptable. The intention was to develop a system in which all the elements of a DGH were designed in a compatible way, utilising a number of standard departments in a range of sizes, and assembled to form hospitals of up to four storeys in a variety of shapes and sizes to meet particular area service needs and different sizes. Although the ultimate aim was to obtain maximum value for money at a total cost comparable with that of a hospital built in the conventional way, early studies showed that the capital cost of a Harness hospital was slightly greater than that of the equivalent hospital of conventional design. Highly ambitious and costly, the Harness concept was itself defeating and the financial constraints of the mid to late 1970s ensured that very few Harness hospitals were built and none in Wales. The foundation had been laid, however, for the Nucleus design concept.
THE NUCLEUS HOSPITAL

Based on the assembly of interchangeable templates each in the shape of a uniform St George’s Cross and designed to produce a low-rise building with no more than three floors, the Nucleus concept proved to be a considerable success. Templates could be used for all functions, be it wards, operating theatres, treatment rooms, out-patient department or laboratory, and could be attached to each other at the ends or sides. As well as being placed on each other up to a height of three floors, the templates could also be arranged to suit the area, shape and contours of a variety of sites. Able to provide 300 beds at a building cost of under £6m at 1975 prices, the basic pattern of the Nucleus design offered considerable flexibility and could provide a range of departments to meet local needs at stages that could be expanded later.

Produced by the DHSS as a Nucleus package, the concept enabled Regional Hospital Boards to either use the standard designs or create their own internal layouts and select the external appearance, subject to the constraints of the template principle. The design could also be readily modified for low energy consumption requirements and made extensive use of roof spaces for the transit and accommodation of engineering services. The Nucleus concept was to be used in Wales for the design of three new district general hospitals and for the further development of district hospitals at a number of major sites.

FURTHER ORGANISATIONAL CHANGE

On 1 April 1982, the NHS was to undergo a further reorganisation which, though not as radical as that of 1974, would cause a great deal of disruption at a time when the service had barely recovered from the previous upheaval. In December 1979, the DHSS and the Welsh Office had issued the consultative paper Patients First, on the structure and management of the NHS in England and Wales, outlining the Government’s proposals for change. These, it could be argued, were a response to a general dissatisfaction with the 1974 reorganisation.
Certainly there had been much criticism of the existing organisational structure and of the management arrangements in particular. The 1979 Report of the Royal Commission on the NHS did not, however, have much influence, if any, on the proposals.

Patients First envisaged a pattern of operational authorities similar to the single district AHAs already in existence and proposed District Health Authorities based on the boundaries of the existing district or single district areas. This represented the replacement of the system of areas and districts by a single tier system based on the districts. Regional Health Authorities were to be unaffected by the dissolution of the AHAs and the creation of DHAs.

Although the original proposals for Wales were included in Patients First, the Welsh Office issued in July 1980 a paper entitled The Structure and Management of the NHS in Wales, which consulted further on certain matters while announcing some decisions. The final form of reorganisation in Wales was announced in the House of Commons in June 1981 and set out in a Welsh Health Circular. It was decided to remove one tier of management by abolishing the districts and retaining the AHAs renamed as District Health Authorities. It was argued that most of the administrative districts, unlike in England, were too small to make viable DHAs. It is surprising, therefore, that the one exception was the division of the Dyfed Area Health Authority to form the Pembrokeshire DHA and East Dyfed DHA. In contrast, the Mid Glamorgan DHA continued unchanged to serve one of the largest district populations in the UK. Apart from the division of Dyfed, there was no other change of statutory authority in the Principality. WHTSO remained largely unaffected by the 1982 reorganisation.

CONSTRUCTIONAL DIFFICULTIES

During the late 1970s and into the 1980s, the NHS estate was beset by a series of design and construction problems associated with new buildings. These would be notable if only for their intrinsic technical nature and the cost of remedial work. In Wales such problems were also to contribute to prolonged delay in the completion of two major new district hospitals and to result in legal actions. These problems were further complicated by the fact that the design had been completed and in most cases the construction commenced prior to 1974 under the supervision of now defunct health authorities. In addition, the defects came to light and were to need rectification at a time of considerable sensitivity. The corporate relationships involved in exercising authority and responsibility for the capital health building programme were still in relative infancy after being completely changed and realigned by the 1974 reorganisation.

Problems at the University Hospital of Wales concerned the defective mosaic cladding panels on the main building facade and the external walls of the residential accommodation. The defects arose from weaknesses in design, compounded by poor construction and difficulties of site supervision. It is ironic that the design was chosen as a result of an architectural competition. The design team for the hospital had been a consortium of private sector consultants acting for the Board of Governors of United Cardiff Hospitals as clients. It is pertinent to note that the hospital only came within the responsibility of the Welsh Hospital Board shortly before completion in 1971.

At Ysbyty Glan Clwyd the largest single factor for the delay and additional cost was design and construction defects associated with the structural steel framework of the building followed by inadequacies in the design and installation of certain electrical engineering services. To a certain extent the failures were also reflected in the design of the sister hospital, Prince Charles Hospital, Merthyr Tydfil. The design of both hospitals had been undertaken by a hospital design consortium of private sector Consultants appointed by the Welsh Hospital Board.

In the case of Ysbyty Gwynedd, Bangor, major faults arose from design weaknesses concerning the kitchen, residential accommodation and engineering services. The design team was once again composed of a consortium of private sector Consultants, the last to be appointed by the Welsh Hospital Board before its dissolution. Construction at Bangor did not commence until post reorganisation in 1976.

In each case, redress was pursued through legal action against the Consultants and the Contractors where they were considered to be responsible. Inevitably this drew considerable media publicity, much of it sensational, ill-informed and tending, regardless of true circumstances, to censure those who not only had the unenviable task of investigating
CONSOLIDATION OF THE ESTATE

and correcting the defects but were also the Plaintiffs in law. While the annoyance of the public and of officials was completely understandable, since they were naturally less than sympathetic to the delays and disruptions that occurred, it remains a matter of regret that many misconceptions were not corrected at the time.

Wales was not alone in experiencing problems with the design and construction of Health Service buildings. The House of Commons, Committee of Public Accounts, was to document in its report of May 1982, evidence taken in the previous March in respect of the cost of remedying defects in hospitals throughout the UK. It was noted that the Auditor General’s review of the extent to which defects had arisen on new hospitals brought into operation in the NHS in recent years, indicated that although these were not widespread, a few individual cases were serious. Rectification of defects in thirteen hospitals (including Bangor DGH) was seen as likely to cost at least £30 million, though this could be set against a hospital building programme which had cost £3,000 million over the previous ten years. Officers of the Government health departments, in their evidence to the CPA, were quoted as considering that most of the faults and defects were not unique to hospital buildings and reflected the general experience with buildings designed and constructed in this period. While considering themselves motivated by concern and far from being complacent, they believed that hospitals were quite complex buildings and did not have an undue measure of failure compared with construction projects at large. Also included in the evidence to the CPA was a report on a study by the Building Research Establishment in 1975, which suggested that the incidence of construction failures in hospital building, assessed at that time as 5 per cent, was fairly low when compared to houses and factories at 13 per cent, and offices and other buildings at 18 per cent.

The Committee of Public Accounts questioned whether the health departments or authorities vetted and checked the detail of designs prepared by consultants to confirm that they contained no serious faults. The DHSS considered that detailed vetting would be a duplication of effort, and that whilst glaring design defects might be detected, such checks could not be expected to reveal latent errors of design. The Welsh Office indicated that WHTSO, who commissioned consultants, did not normally interfere in the details of design or construction so as to avoid
lessening the legal liability of the consultants or contractors. Welsh Office also expressed concern about the application of this approach as they considered that the design defects at Bangor DGH ought to have been identified much sooner (WHTSO had discovered the kitchen defects in October 1980 and made recommendations to the Welsh Office which were not immediately accepted). Welsh Office declared the intention to set up an enquiry to clarify the roles of Welsh Office, WHTSO, the health authorities, consultants and contractors, and to investigate the precise way in which Capricode procedures were applied.

The defects encountered at Ysbyty Glan Clwyd had undoubtedly made a major contribution to the long delay in bringing the hospital into use. They were, however, only part of an extended saga of misadventure that illustrated how an already prolonged process could be stretched to extraordinary length by the interrelation of events that were cumulative in effect. Planning of the hospital had commenced in 1966 and construction began in 1971. Completion was anticipated at the end of 1975. Labour disputes were common at this time on large construction projects in the North West and North Wales. The hospital construction site at Rhyl was a target for action which resulted in stoppages of work from July 1974, that overall would delay the contract by over nine months. The structural design and construction problems had extended to a dispute between the Consultants and the Main Contractor with regard to responsibility. This resulted in a further stoppage of work of over eight months while the situation was resolved. The Main Contractor experienced financial difficulties with the result that the time taken to revitalise the contract was to extend to over twenty months before a revised completion date of May 1977 was agreed. The situation between the Design Team and the Main Contractor was such, however, that WHTSO had to take an increasingly active role in the management of the contract. Failure to complete the contract by the revised date obliged WHTSO, with the agreement of the Welsh Office, to institute a programme to complete the work and take over the hospital department by department. By October 1978, the hospital had been brought to a standard that allowed partial occupancy of the premises by the Health Authority.

Many of these events had occurred at the time of the inception of the new Clwyd Health Authority following the 1974 reorganisation, and it was to the new Authority, as users, that the hospital would have to be acceptable. The Health Authority became increasingly aware of the limitations imposed by a hospital design that was now some ten years old. Changes in medical policy and practices had produced a number of additional requirements, including a sterile products unit and radio pharmacy department. In addition, WHTSO staff, as a result of their increased involvement, had identified deficiencies in the design of certain engineering services which required remidal action prior to hand-over. All the additional works thus identified became part of an extensive Additional Works Programme to be completed by a Management Contract let to a new Contractor and scheduled to be completed by May 1980. The work was extensive and the programme extremely demanding in view of the hospital being partially occupied. Patients were eventually admitted in May 1980.

In the case of Ysbyty Gwynedd, Bangor, the design defects extended the construction time to the extent that the hospital opened in 1984 after remedial and additional works completed under a Management Contract awarded to the original Main Contractor. Planning had commenced in 1970 and construction had started in 1976 with an expected completion in 1980.

Legal action taken in pursuit of damages arising from the design defects at both Ysbyty Glan Clwyd and Prince Charles Hospital resulted in settlement out of Court. The legal process in respect of Ysbyty Gwynedd was protracted and made extensive claims on the time of several senior staff at WHTSO. Settlement by the provision of a substantial sum plus waiver of outstanding design fees, was achieved through the High Court in favour of Gwynedd Health Authority and the Welsh Health Common Services Authority (formerly WHTSO) as joint Plaintiffs, by an 'Order of Consent' agreed prior to the Hearing.

THE AGENCY AGREEMENT

The Welsh Office enquiry referred to in their evidence to the Committee of Public Accounts resulted in a report that was to become known as the Enquiry Report – NHS Building Projects in Wales: Planning, Control and Management which was published in April 1982, but not issued until the following September. The Enquiry Report drew on three sources of recommendations: firstly the Rayner Scrutiny carried out in
1980 into Welsh Office procedures for processing major NHS building projects; secondly the recommendations made in 1981 by a Chairman's Working Party looking at the health capital programme in Wales, and directed at producing a draft agency agreement that would apply to the relationships between the DHAs and WHTSO in the management of capital schemes; thirdly a memorandum and circular issued by the Welsh Office in January 1982, which indicated that from 1984-85 the Secretary of State intended to transfer to the district health authorities responsibility for planning and undertaking all their capital works, inclusive of those schemes hitherto regarded as non-delegated and in an upper category above a certain threshold (£1.5m in 1983-84). The Welsh Office disengagement inherent in this circular indicated a radical departure from the arrangement for non-delegated schemes that had applied since 1974. The WO would only reserve responsibility for schemes serving regional needs and sanction approval of major capital schemes. The point was also made in the circular that WHTSO was required, under its Statutory Order (1973), to act, if so directed, on behalf of a DHA as well as on behalf of the WO. In this context, it was suggested that the duality of the WHTSO role had led to misunderstandings, compounded by disagreement about the centralisation of scarce skills and resources and the decentralisation of decision-making. The Circular indicated that after 1984-85 WHTSO would normally undertake work on capital projects as the agent, and on the instructions of a DHA.

The Enquiry Report was strangely muted on the subject of design and constructional defects and totally without suggestions on how these could be avoided or dealt with in future, raisons-d’etre of the enquiry as put to the Committee of Public Accounts. The Report was also remarkable in that it advocated an even greater reversal of roles that would see each of the nine DHAs taking over responsibility for all management functions within the control of their respective capital schemes, including the setting-up and servicing of project teams and the undertaking of all stages of Capricode.

The results of such a change would inevitably be the reduction of the WHTSO role to, at best, that of provider of in-house design services in exactly the same manner as a private consultant and, at worst, to that of supplier of an at-request advisory service to DHA project teams, with no further involvement. Experience in respect of delegated schemes had already shown that the 1974 arrangements for WHTSO to be consulted on such schemes and to be involved in nominating consultants where the work could not be undertaken by either the DHA or WHTSO, had been progressively ignored. It had become exceptional for WHTSO to be even consulted. By 1983-84, out of schemes to the value of £8m delegated by the WO to the DHAs, only those to the value of £500,000 were being undertaken by WHTSO, whereas the Organisation was acting on behalf of WO on major projects exceeding a total value of £24m.

The proposals of the Enquiry Report were to be robustly challenged by the WHTSO Board and its officers, on the following grounds: firstly they ran counter to the original concept of a central multi-disciplinary works capability for major schemes provided on an all-Wales basis for reasons of efficiency and economy of scale; secondly, in the circumstances of 1984 onwards, the WHTSO work load could no longer be assured and its role would become increasingly untenable as an efficient and economic service. The eventual outcome was to be embodied in two Welsh Health Circulars of April and May 1983, that detailed the arrangements for the control of capital schemes and that were to become known as the Agency Agreement. The essential features were such that District Health Authorities would be entirely responsible for the control of schemes, subject to a number of conditions. For schemes with a total cost below £150,000 DHAs would be responsible for the appointment of consultants and contractors. The services of WHTSO, however, could be sought at discretion, particularly where this was made desirable in view of complex elements for which WHTSO had special expertise.

For schemes with a total cost of £150,000 or more but below £600,000, the DHAs were first to consult WHTSO to determine whether, within a time table realistically required by the Health Authority, the Organisation was able to undertake the design work and supervision of construction on the Authority's behalf. If WHTSO was unable to offer such services the procedure relating to smaller schemes would apply. For schemes with a total cost of £600,000 or more, the Health Authorities were obliged to utilise the services of WHTSO for the management of all such schemes. In respect of this latter category, the DHA would be responsible for overall co-ordination of the project and
manage the planning and briefing stages, with WHTSO assistance as appropriate in the preparation of submissions to the Welsh Office required under Capricode. After consultation with the DHA, WHTSO would appoint consultants if unable to provide in-house design services and supervision of construction. WHTSO would manage the stages of building and engineering design and construction and also appoint contractors. For contractual purposes, WHTSO would both sign agreements with consultants and contract documents as Principals, and make financial payments as the Employer under the contracts. The Project Team was to be chaired by a nominee of the DHA who would be responsible for the scheme and be the focus of communication with WHTSO. The Project Manager would be appointed by WHTSO who would also service the Project Team throughout. While WHTSO would be responsible for the technical commissioning of the building and engineering plant and for its demonstration to District Works staff, the DHA would have the responsibility for the operational commissioning of health services and the function of departments.

The Agency Agreement was subject to minor review in November 1986 and other than for some changes in the financial limits due to inflation, was to remain essentially unchanged until privatisation of the all-Wales design and project management services in 1996. The service provided on an all-Wales basis was thus subject to a period of relative stability and continuity that would enable it to withstand the trend towards lower expenditure on capital works and policies that would eventually lead it to being exposed to open competition.

In October 1983 the report of the NHS Management Enquiry (The Griffiths Report) was published. Initially referring to England only but eventually applied in Wales, the report recommended the principle of general management as applied in commercial business. By 1985, each health authority in Wales, including WHTSO, had appointed a General Manager in the role of chief executive. The Griffiths Report had also indicated that the property function should be developed so as to give a major commercial reorientation to the handling of the NHS estate. It suggested that procedures for handling major capital schemes and disposal of property should be streamlined with maximum deviation to the periphery - a presage of a trend to come.

A Statutory Instrument issued in 1985, re-enacted the WHTSO Establishment Order of 1973 by reconstituting the Organisation and changing its name to the Welsh Health Common Services Authority (WHCSA).

**UNIFORM HOSPITAL DESIGN**

The Nucleus system of hospital planning, briefing and design, came to dominate the hospital building programme throughout the 1980s. By 1992 some eighty Nucleus hospitals had been completed throughout the United Kingdom and a further fifty were in various stages of planning and construction.

**DISTRICT GENERAL HOSPITALS IN WALES**

| YSBYT Gwynedd, Bangor | 1976 |
| Morriston | 1980 (NUCLEUS) |
| Wrexham Maelor | 1981 (NUCLEUS) |
| Princess of Wales, Bridgend | 1981 (NUCLEUS) |
| Prince Philip, Llanelli | 1983 (NUCLEUS) |
| Royal Glamorgan, Llantrisant | 1994 (NUCLEUS) |

In Wales, the system was to be used extensively after 1980 to complete the pattern of District General Hospitals that had been commenced over twenty years earlier. The Nucleus System allowed standard designs for the many elements of a DGH to be planned on a modular basis creating hospitals which would, however, be unique in content, construction and appearance. These standard designs could also be used for the extension of existing hospitals by the addition of departments or groups of departments. The system was sufficiently flexible to allow design innovation. The architectural designers of the WHCSA were particularly successful in developing solutions that met the changing needs of client health authorities while being wholly compatible with Nucleus.

The earliest Nucleus developments in Wales were based on the extension and phased expansion of existing hospitals. Work commenced on the extension of St Woolos Hospital, Newport, in early 1980, to be
followed by the start of developments at Morriston Hospital in late 1980 and at Wrexham Maelor Hospital in 1981.

The Nucleus System was also to be used for two new district general hospitals during this period. Work commenced on the building on green field sites, of the Princess of Wales Hospital, Bridgend in 1981 and of the Prince Philip Hospital, Llanelli, in 1983. The last district general hospital to be built in Wales within the first fifty years of the NHS, is also based on the Nucleus principle. Work commenced in October 1994 on the major Taff Ely and Rhondda District General Hospital at an attractive green-field site in Mid Glamorgan. The project is due for completion towards the end of 1998 and is scheduled to be opened for the admittance of patients in 1999, as the Royal Glamorgan Hospital. This hospital will complete a pattern of fifteen DGHs established in Wales since the early 1960s, one more than the number envisaged by the Welsh Hospital Board in 1959 when assessing the requirements for new hospital building in the Principality.

The extensive use of the Nucleus System over two decades of hospital building, indicates that users recognised its potential as a method of developing briefs for health care facilities as well as an effective framework for developing schemes. The system not only reduced the time required to bring a project from planning to completion but also provided savings in the cost of design. Hospitals based on the system could be readily constructed in stages with a design that greatly simplified compliance with statutory requirements such as fire precautions.

A Department of Health (NHS Estates) review of the system, conducted in 1992, did, however, indicate a decline in use to the extent that only some 15 percent of schemes in the 1993-94 capital programme in England could be identified as Nucleus. Some users did by this time perceive the system as one discouraging creativity in design, with a tendency to be too prescriptive, a weakness that had, to some extent, been overcome by the innovative design solutions adopted by Welsh health authorities.

THE COMMUNITY HOSPITAL

The concept of the District General Hospital had been based on the precept of providing a full range of hospital services which included diagnostic and treatment facilities for in-patients and day-patients, maternity, psychiatric, geriatric and rehabilitation facilities. This was in addition to the specialist hospital provision for the mentally ill and the elderly. As the network of DGHs became established it was, however, against a scenario of significant change in clinical practice and in medical and nursing care. Improvements in medical procedures were lessening the trauma of surgical operations and more effective drug medication therapy was also reducing the hospitalisation stage of serious illness. Treatments were becoming less demanding both in terms of the continuance of high level medical and nursing care, and of prolonged hospital stay. More rapid hospital throughput became possible against a background where the general betterment in social conditions and housing, allowed the discharge of patients to an improved home environment. Generally, the DGH provided the same ward facilities and levels of medical and nursing care throughout so that patients requiring
less care were just as costly to accommodate as those requiring more acute care.

Out of these considerations emerged the concept of local community hospitals for in-patients who did not need the back-up facilities of the high technology DHGs or of the single speciality hospitals. Those planning health care facilities were soon to grasp the opportunity to give greater emphasis to the provision of locally based health care in less heavily serviced community hospitals. This would not only reduce the cost of accommodation but also relieve the pressure on acute beds in DGHs at a time of increasing demand arising from advances in medical treatment.

The community hospital, although having no surgical facilities, could provide convalescent accommodation for post-operative patients, and those having undergone serious treatment, on transfer from the DGH. A local hospital nearer to patients' homes could provide the additional comfort of proximity to relatives and friends, an aspect greatly welcomed by the growing numbers of elderly patients needing the care that could be more appropriately given by a community hospital. Respite care could also be provided at times of need for those normally cared for at home.

In a number of cases, the community hospital was seen as an alternative following the closure of what was often a highly regarded local hospital, to which the community had been attached through patronage and support over many years. Such loyalty and attachment also extended to the nursing and other staff who enjoyed the greater continuity of contact with patients made possible by the working environment of the local hospital.

The concept of a modern community hospital was particularly relevant in Wales where the characteristics of geography, topography and spread of population contributed to the marked contrast between the facilities enjoyed by those living in the urban town and city areas, and those available to the people of the more sparsely populated rural communities. Access to appropriate health care within a reasonable travel distance and the availability of transport, were primary considerations in this respect. Such factors were to influence a number of Welsh health authorities to the extent that eight new community hospitals were to be built between 1983 and 1996.

Initially, very little design guidance existed for this type of hospital. Nevertheless, the Design Practice of WHCSA, responding to the nursing and medical policies of District Health Authorities, and taking their brief from clinicians and planners at local level, were able to generate a series of hospital designs that established a track record for award-winning standards in community hospital planning.

The first of this new generation of purpose designed hospitals was to be completed in 1983, in the grounds of an old cottage hospital on the outskirts of the town of Mold. The second was to follow in 1986 at Ystradgynlais in the valley of the River Tawe, replacing the Adelina Patti Hospital located further up the valley.

By 1990, the old general and maternity hospital, on the outskirts of Chirk, had been demolished and a new community hospital constructed in its place. Ysbyty George Thomas, located near the centre of Treorchy, North Rhondda, was completed in 1991, and the Deeside Community Hospital at Aston in Clwyd followed in 1992, replacing the Catherine Gladstone Hospital at Mancot.

Although all these hospitals met a specific design brief developed by the design teams and their clients, based on the services to be provided and the characteristics of location, the design solutions also contained a number of common features. Each community hospital was relatively small and was planned in accordance with local need as determined by the project team. Constructed as mainly single storey in traditional materials, each building was integrated with its surroundings by landscaping and extensive planting. Light, airy buildings were created by the use of natural light with low energy consumption being a design
Further hospitals of the type were to be built up to 1996, namely the Barry Neighbourhood Hospital, South Glamorgan, the Penrhos Stanley Community Hospital, Ynys Môn, and the Ebbw Vale Community Hospital. Much of the planning and design experience gained from this programme came to be used in schemes to enhance existing hospital sites, this being a preferred option for some health authorities when providing community health facilities, care for the elderly and respite care. Such application is exemplified by the new building developments undertaken during the early 1990s, at the Brecon War Memorial Hospital, Ystrad Mynach Hospital, and the Aberdare General Hospital where the Echelon design was used for two twenty-bed wards. It is also worthy of note that the WHCSA Design Practice was to be commissioned to undertake the scheme design for three thirty-bed medical wards for the elderly at Glenfield Hospital, Leicester, the first built example of acute care beds in a DGH using the Echelon principle.

**IMPROVEMENTS TO THE ESTATE**

Whilst appearing to be dominated by the completion of new hospitals, the 1980s also saw extensive improvements and enhancements to the existing hospital stock. This work was to continue into the 1990s and contribute substantially to the modernisation of the estate to the standard that exists at the present day. For example, at Singleton Hospital, Swansea, such work included the building of the West Ward Block, Pathology and Mortuary Department, Physical Medicine Unit, a Sterile Products Unit, development of the Operating Theatres and upgrading of the Boiler House.

At Wrexham Maelor Hospital work included the construction of the second phase of development and a Hospital Sterile and Disinfection Unit. The North Wales Artificial Limb and Appliance Centre and a fifty-four bed Acute Psychiatric Unit, were also built within the campus of the hospital. Schemes in North Glamorgan included adaptations at St Tydfil’s Hospital, Merthyr and the major Nucleus project at Prince Charles Hospital which comprised paediatric, obstetric and gynaecological wards as well as a Special Care Baby Unit. In West Glamorgan, a major redevelopment was completed at Tonna Hospital, Neath.
In Dyfed, early in this period, a new ninety bed unit had been completed at St David's Hospital, Carmarthen. Further work was undertaken to develop the Bryntirion Hospital, Llanelli and ward upgrading and a geriatric day unit provided at the West Wales General Hospital, Glanwili.

The Morriston Hospital, Swansea, was subject to extensive development work including the provision of geriatric wards and day unit, renal dialysis and maxillo facial units, pathology and mortuary department, and a new boiler house. Additional works included the School of Nursing, Hospital Sterile and Disinfection Unit, and the MRI Diagnostic Imaging Scanner. The hospital campus was to accommodate the regional Burns and Plastic Surgery Unit, on transfer from the St Lawrence Hospital, Chepstow, as well as a regional Cardiac Unit.

Work at the Princess of Wales Hospital, Bridgend, included the second phase development of the hospital, noteworthy for use of the Focus acute care planning system developed by the WHCSA Design Practice as a variation on the Nucleus principle. Although based on a different shape and configuration of standard template and incorporating Echelon ward bays around a central nurse base, Focus was wholly compatible with the standard Nucleus briefing method and was initially designed to reduce the deep plan aspects of the Nucleus layout. Another innovative inclusion by the Health Authority in the second phase development was the Patient Hotel. This was a short stay facility having much in common with the community hospital principle in that it provided accommodation for patients who did not require direct or immediate nursing care and who would otherwise occupy fully nursed acute hospital beds. Other projects on the hospital campus included a Psychiatric Unit and a MacMillan Cancer Relief Centre.

Projects in North Wales included a Hospital Sterile and Disinfection Unit at Ysbyty Glan Clwyd and a new 74 bed Psychiatric Unit built in the grounds of the hospital. A facility for the elderly mentally ill was completed at Colwyn Bay Community Hospital and the Hergest Adult Mental Illness Unit built at Bangor. Development schemes were completed at Llandudno Hospital and Cefni Hospital, and a Special Care Baby Unit provided at Ysbyty Gwynedd.

In Gwent, a Mental Illness Unit was completed at Torfaen and major work continued on the later phases of the Royal Gwent Hospital, Newport, including major kitchen and X-ray Department adaptations. The Gwent Centre for Nursing and Midwifery Education was completed on the site of St Cadoc's Hospital, Caerleon.

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In the Cardiff area, the Artificial Limb and Appliance Centre had been established at Rookwood Hospital and a major Obstetrics Unit built at Llandough Hospital to be followed by a new Operating Theatre Department incorporating endoscopy suite and day surgery unit and a central sterile supplies unit.

A new central boiler plant and a waste incinerator and heat recovery system were provided at the University Hospital of Wales where a major cook-freeze kitchen and catering system was also installed and brought into use. In the arena of diagnostic imaging and radiography, developments at Velindre Hospital included the installation of a new CT Scanner and Linear Accelerator, while an MRI Scanner was installed at Cardiff Royal Infirmary.

A new purpose built headquarters facility for the Welsh Blood Service was completed at the end of 1996, on an attractive rural site adjacent to the new Royal Glamorgan Hospital under construction near Llantrisant, Mid Glamorgan. This new building forming part of the WHCSA estate, enabled the Welsh Blood Service to relocate from its former site at the Prince of Wales Hospital, Rhydlafar.

In all, more than two hundred and fifty major projects were to be undertaken in the period from 1980 to 1996. Consultancy design services were provided by the WHCSA in-house capability in respect of 147 schemes for architectural design, 152 for engineering services design and 106 for quantity surveying services. Of these, full design services in all three disciplines were provided on 60 projects with architectural and engineering design only being provided on a further 25 schemes.

Internal reorganisation within the WHCSA in 1989 resulted in the formation of the Directorate of Health Estate Development and the
establishment of three subordinate Divisions. The multi-disciplinary Design Practice Division brought together the three main professional design sectors of architecture, quantity surveying and building services engineering, and included interior design, landscape design, graphics and site control and inspectorate. The Building Procurement Division was also multi-disciplinary and provided project management services for major capital schemes and an advisory service to the Welsh Office Health Department. The Special Services Division offered specialist engineering and estate management services to the NHS in Wales and the Welsh Office Health Department.

By 1992, as the result of an internal organisational development review, the Directorate and its Divisions were re-designated the EstateCare Group consisting of three distinct business units, namely EstateCare Design, EstateCare Projects and EstateCare Services, each with a unit Director. The three units, together with a small core business management section providing administrative and business finance back-up to the Group as a whole, came under the overall direction of the Group Managing Director. It was in this form that the EstateCare Group continued to operate as part of the WHCSA, within the internal market provisions emerging within the NHS in Wales, until the privatisation of major elements of its business in 1996.

The NHS ended its fourth decade with serious financial difficulties. Progress in medical technology, higher public expectations and the need of care for the growing numbers of elderly people, all contributed to increased demands on the service at a time when resources were growing more slowly as a result of government public spending restrictions.

The White Paper Working for Patients published in January 1989, resulted from an internal government review which relied heavily on political intent and a plethora of think-tank reports, with little external consultation. It is doubtful whether public consultation would have produced a consensus for yet further radical reform.

The provisions of the NHS and Community Care Act 1990, stopped short of introducing health insurance as a source of revenue for health care and retained the principle of central funding from taxation. Great reliance was placed on increasing productivity by the use of performance incentives and the introduction of an internal NHS market by separation of the demand and supply side of health care. The idea of using competition as a vehicle for achieving greater efficiency was in keeping with the socio-economic climate of the time which envisaged that the perceived virtues of the business and commercial world could be applied to the NHS while retaining the service in the public sector.

The existing district health authorities would exercise a health care purchasing function by assessing need and contracting for services on behalf of the populations served. Self-governing NHS Trusts were created to take responsibility for the services provided by hospitals and community care. District health authorities became purchasers on losing their hospital management responsibilities, as their hospital and community services became providers on applying for and being granted NHS Trust status. Purchaser authorities were reduced in size with relatively small boards of executive and non-executive directors, on the same business lines as the new Trusts.

The traditional constitution of authorities was replaced by a commercially orientated leadership with directors often brought in to provide skills from the business community. Trust Boards exercised considerable freedom of action in meeting their responsibilities and could define their own pattern of organisation. Consequently much of the familiar uniformity of the NHS was to become gradually, if not suddenly, eroded.
APPROACHING FIFTY YEARS: REFORMS AND CHANGES

For the first time since 1948, ownership of the health care estate passed from government to the individual authorities of the NHS. Trusts enjoyed considerable autonomy in that they could dispose of their assets including land and property, retain the proceeds and surpluses, and borrow money from both government and the private sector. Trusts were also able to employ staff on locally negotiated terms and conditions of service.

The NHS was thus in its fifth decade, reformed by changes that, while producing less immediate upheaval than previous reorganisations, were to set in motion ideas of reliance on market forces the outcome of which few would care to predict with any measure of confidence.

In 1992, Pembrokeshire NHS Trust became the first formed in Wales. Thirteen further Trusts were created in 1993, followed by another eight in 1994. Eventually, the pattern in Wales would consist of twenty acute, six community based and four ambulance service Trusts. The total number of hospital Trusts was to be slightly greater than the number of Hospital Management Committees formed in 1948, but there the resemblance ended. As the Trusts were established, the District Health Authorities ceased to have responsibility for hospitals other than those unadopted by the Trusts and regarded as residual estate for disposal.

Estate management inevitably was to be affected by the business orientation of the new reforms, although the consequences could be said to have simply intensified a process already underway. Many non-clinical support services were increasingly regarded as being outside the role of mainstream health care management. For example, competitive tendering had been used since the mid 1980s to test the efficiency of support services such as cleaning, catering and laundry services. As part of government policy for the public services as a whole, such market testing was now to be extended to a wider range of NHS estate services, including building and engineering maintenance.

Some NHS managers had long believed that hospitals should retain only a skeleton maintenance staff and use external contractors for the majority of work. This concept would now gain ascendancy to a point where a hospital maintenance department could, in whole or in part, be subject to external competition through a tendering process. If successful, such a department would be party to an internal contract with its own employing authority.

One aspect of the ability of NHS Trusts to determine their own management structures, was a degree of diffusion in the role of the estate officer. The adoption of a facilities management or a hotel services model often resulted in the estate professions becoming included in a wider management role.

Personnel aspects of estate management had been subject to change since the early 1980s when the relatively simple structure of hospital engineers and building officers was replaced by seven grades of Works Officer. This had been further changed by 1990 when regional and district designations were conjoined into six grades of Estates Officer. While this enabled employing authorities to grade officers in accordance with individual responsibility, the advent of NHS Trusts with the attendant fragmentation of authorities adopting differing management patterns, inevitably produced a measure of disparity. Furthermore, senior estate officers could also be included at appropriate levels of senior management, with performance related enhancement dependent on individual review. In a competitive employment market health authorities were able to apply fixed term contracts of employment. Such conditions of employment would eventually become increasingly used on a short-term basis as Trusts became uncertain of the long-term future arrangements of their estate management organisations.

The design and project management services provided on an all-Wales basis by the EstateCare Group of WHCSA, had already become subject to fee competition in common with the design consultancy industry. The EstateCare Group was well placed to apply an already established and comprehensive computerised business management and costing system to its trading relationship with the Welsh NHS and Welsh Office as part of the internal market. The Group was thus able to invoice for work on the basis of full overhead costs inclusive of an element of WHCSA corporate management costs. The EstateCare Group on the basis of its independently accounted divisions of design, project management and services, could plan its neutral profit business over a number of years in accordance with service level agreements made with client authorities. Furthermore the Group was able to develop a small but significant element of profitable business with clients external to the NHS in Wales, including the private sector.
Although the EstateCare Group, for some years, had been moving towards obtaining its income by competition, all major capital schemes had remained protected by the 1983 Agency Agreement which gave EstateCare Design first refusal of the design work. In 1994, as the capital programme diminished, the Welsh Office withdrew the design aspect of the Agreement. It did, however, continue in part in that it obliged NHS Trusts to use the services of EstateCare Projects for major schemes of over £1 million.

EstateCare Services had from the outset of the internal market operated on a lump-sum or time charge basis in a competitive situation, although it was recognised that many of the services of a specialist nature were not offered by the private sector. Overall, in the context of the internal market, the EstateCare Group was run as a commercial self-financing business, albeit non-profit making, with all savings made returned to the NHS as a contribution to patient care.

The EstateCare Group had already demonstrated its commitment to quality by participation in the WHCSA Total Quality Management initiative. In 1994 it was to further confirm its dedication to satisfying customer requirements by achieving Quality Assurance Certification under the aegis of the British Standards Institution through a quality management system maintained to the BS EN ISO 9001 standard.

In September 1993 the WHCSA relocated its offices to Crickhowell House, part of the Capital Waterside development of Cardiff Bay.

By the early 1990s in accordance with the political determination of the time, the building design and project management functions of the regional health authorities in England had already been privatised or otherwise disposed of outside the public sector. At the English national level, NHS Estates remained as an advisory body, constituted as an agency of the Department of Health of which it had formerly been an integral part. It was probably inevitable that a similar process would eventually follow in Wales. By the end of 1995, on the instructions of the Secretary of State for Wales, WHCSA had invited tenders from organisations interested in acquiring the health care, building design and project management business of the EstateCare Group. The elements of the Group offered for sale had an annual turnover in the region of £6m and employed about 170 staff. Over seventy organisations expressed initial interest in the business. Privatisation was concluded after a rigorous process of short listing and assessment by an independent evaluation panel following submission of detailed proposals and final bids. After acceptance by WHCSA, the sale made to the Capita Group PLC in conjunction with a management team of four EstateCare Design senior officers, was approved by the Secretary of State. Conclusion of the sale in April 1996 ended a hospital design capability integral to the NHS in Wales, that had existed for almost fifty years.

Notwithstanding the climate for privatisation, it was considered essential that certain functions hitherto provided by the EstateCare Group should continue to be available from within the NHS. Consequently, approximately forty staff were retained from the Group to form Welsh Health Estates, established in April 1996, as part of the WHCSA. Consisting of a multi-disciplinary team of professional and technical officers, Welsh Health Estates continues to provide support and specialist advice to the Welsh Office in relation to estate matters as well as professional advice to NHS Trusts in support of their informed client role. As such it provides a unique single point source of support in specialist and technical areas including X-ray, Health and Safety, Environmental Issues, Fire Precautions, Sterilizer Engineering and Statutory Regulations. Support for Welsh Office includes the monitoring of major capital schemes and the review and evaluation of business cases and plans for capital developments. WHE also maintains the Welsh NHS Land and Property Portfolio and estate database, and provides specialist estate management support to NHS Trusts in the area of property acquisitions and disposals. It is unlikely that such a small but highly concentrated source of informed experience and expertise in the field of health care building and engineering could be replicated and maintained other than within the NHS at national level.

The closure of hospitals as a consequence of the development of district general hospitals and the emergence of the modern community hospitals, has already been described in that context. The closure of small uneconomic units was inherent to the 1962 Hospital Plan and its long term objectives. Among the older stock of hospitals the first to be closed were those costly to maintain or unsuitable for development due to site constraints or inappropriate locations in relation to the population served. The process was constant: eleven hospitals closed between 1974 and...
and 1980, a further twelve by 1985 and an additional thirteen by 1990. Throughout the 1980s, government policy had placed increasing emphasis on the need to increase the efficiency with which NHS resources were used. Land and property assets were to be no exception.

By 1989 the NHS estate in Wales consisted of 165 hospitals, 273 health centres and clinics, 77 ambulance stations and nearly 300 other properties mostly used for residential or office purpose. The land area stood at approximately 1100 hectares, almost half of that taken into the NHS in 1948.

Pressure for hospital closures continued to intensify under the guise of estate rationalisation, the influence of reports from the Audit Commission and the National Audit Office pointing to areas of saving and better value for money, and the overall scrutiny of the House of Commons Committee of Public Accounts. The 1990 NHS reforms served to accelerate the process. Proposals for care in the community looked to the adoption of a policy of providing services that enabled a move away from long-stay hospital care. Central to the policy was the increased use of both local authority and private sector residential and nursing home care for the elderly, and the down-sizing of the large psychiatric hospitals with eventual closure as the objective. Furthermore, the introduction of capital charges was to provide a direct financial incentive to authorities and Trusts to dispose of all unused or under utilised health care estate. Introduced as part of the 1990 reforms, capital charging ensured that, for the first time ever, health authorities were required to account for the cost of providing their capital assets. NHS Trusts were expected to make payment of a percentage return per annum based on the capital value of their land, buildings and equipment. This was, perhaps, a somewhat crude financial expedient but an essential pre-requisite to fair competition in the internal market.

The effect of these various factors is seen in the accelerated progress of hospital closures in Wales after 1990. A further 24 hospitals were closed by 1995 and 12 more by the end of 1997. It can be reasonably anticipated that further closures will reduce the total number of hospital sites remaining within the NHS in Wales to below 125 by late 1998.

A further effect of the 1990 reforms was that private finance not only became acceptable but was positively promoted as a source of capital investment. The Capital Investment Manual, published in 1994, introduced the conditions of the Private Finance Initiative (PFI) whereby all future capital schemes would need to investigate whether private finance could be used in preference to Treasury funding. PFI was seen as a way of maintaining a capital programme at a time of heavy
governmental restraint on public spending. Although a number of plans were developed for projects to be funded by the private sector and leased to the NHS, few proceeded to the reality of construction. The overall effect of the new policy was to place a moratorium on major capital schemes while options were appraised and the risks and long-term effects assessed. The concept of PFI does not appear to have been weakened in principle by the change of government in May 1997 and may yet prove to be a pointer to the future of the NHS estate.

The quality of the environment experienced by patients in hospitals is vital to the healing process and it is in this respect that the hospital estate makes an essential contribution to the treatment of illness. The provision of hospital buildings is a very specialised area of work, demanding quality in both architectural and engineering design. Management of the estate ensures the maintenance of a health care ambience that is dependent not only on the building structure and its internal arrangement but also on the supply of various specialised services. These include heating, ventilation, water and electricity and also extends to technical aspects of food preparation, laundry, sterile supplies, medical gases, fire protection and safety in medical equipment.

Technical work of a specialised nature pervades almost all aspects of the health care estate whether supportive of the maintenance tasks, arising directly from technology allied to the practice of medicine or intrinsic to the design and construction of hospital buildings. No review of the NHS estate in Wales would be complete without reference to representative examples of these activities.

NATIONAL ESTATE STANDARDS

At the inception of the NHS very little existed in the way of national guidance or standards specific to the provision and maintenance of health care facilities. The general building and engineering standards of the day were applied as and when appropriate to hospital design, construction and maintenance activities. Statutory regulations, such as those empowered by the Factories Acts, for example, were complied with notwithstanding that crown immunity applied to almost all the activities. It was not until 1991 that crown immunity was to be generally removed from the NHS and the Service became fully subject to practically all relevant legislation.

From the start, however, the NHS was to develop new standards of technology, quality and safety in every category of a wide range of health care estate applications. This initiative was to provide standards that not only achieved international recognition and repute, but would be widely adopted outside the confines of the Service. The NHS estate function in Wales was to make an early contribution to the progress of this work.
The Welsh Hospital Board had established an applied development capability in both its architectural and engineering sections and gradually acquired specialist expertise in many of the varied aspects of estate activity. This enabled it to participate extensively in Department of Health and Inter-Regional Board study groups and working parties and, to a lesser extent, be part of NHS representation on the relevant technical committees of the British Standards Institution. Such a function was to become integral to the work of specialists identified within the estates structure of the Principality and as presently found in Welsh Health Estates. This has enabled the NHS estate in Wales to remain for the greater part of fifty years at the forefront of the development of technical standards at a time of unprecedented change.

The product of such national and inter-regional co-operation was the emergence of a series of UK publications such as Hospital Building Notes, Hospital Technical Memoranda, Standard Specifications and Engineering Data Sheets, and a variety of individual reports giving technical appraisal of developments affecting the NHS estate and its management. The bedrock of effective standards has long been established but the updating and revision process continues in some measure, despite the constraints of economy and reorganisation imposed in recent years. Although lacking the enforcement strength of statutory regulation, many of these internal NHS standards such as Hospital Technical Memoranda, have a status that make it almost mandatory to follow their recommendations.

Most of the early work was associated with providing guidance in areas where none previously existed. The emphasis was to change later to establishing and improving best practices. A small but very significant part of the work was, however, reactive to either systems failure or the emergence and identification of new factors. An incident of failure to properly sterilize intravenous fluids and the identification and association of Legionnaires disease with air-conditioning and water systems, are two notable examples.

LANDSCAPE ARCHITECTURE

The appointment of the first full time NHS Landscape Architect in Wales in 1979 signalled, perhaps, the increasing importance placed on the role of landscape in patient health care. The appointment was to lead to a number of design awards, recognised both in the Principality and Nationally and continued until the privatisation of the WHCSA design function in 1996.

The perceived health care benefits derived from the integration of buildings and landscape is apparent in the increasing attention given to the design of spaces beyond the hospital building envelope. Spaces that, in the early days of the NHS, were all too often hard and uninviting have since been transformed into welcoming areas designed to give pleasure to patients, visitors and staff.

The design of some of the more recent smaller hospitals in particular, illustrates the deeply held belief that trees, shrubs and plants providing seasonal change of colour, fragrance and texture, combined with water features and a variety of hard textured surfaces, have a therapeutic value that can greatly influence patients’ sense of well-being.

More recently greater emphasis has been placed on integrating buildings into the local topography so as to lessen the impact of the new development on the local environment. Some schemes, such as Ystradgynlais Community Hospital, broke new ground, taking this a step further by using landscape properties to create pleasant micro-climates compatible with low energy policies. Thus earth mounds and tree shelter belts on hospital estates are becoming a familiar sight.
INTERIOR DESIGN

In a similar way to landscape architecture, the health care benefits derived from good interior design have been recognised in many recent hospital examples. The appointment in 1970 of the first NHS Interior Designer in Wales saw a determined effort made to consider ways in which the design of interior spaces might benefit patients, visitors and staff. This role continued until the privatisation of the WHCSA design function in 1996.

The bland institutional interiors that dominated hospital designs for over two decades have since been largely replaced by internal spaces designed to create a non-clinical, domestic atmosphere. This has been achieved through the careful selection of colour, finishes, lighting, furniture and soft furnishings, consistent with a non-stressful environment.

SITE SUPERVISION

In order to maintain an identifiable and acceptable standard of health service construction and installation work, the Welsh Hospital Board established a staff of Building Clerks of Works and Site Engineers strategically placed around the Principality to undertake the supervision of building and engineering work carried out by contractors. Their involvement on a permanent basis, enabled the accumulation of a depth of knowledge across the range of health service buildings, installations and equipment. This experience proved invaluable as new schemes were undertaken and future designs developed.

Supervision was provided for projects designed in-house or by nominated consultants and also extended to delegated schemes undertaken by health authorities where assistance was requested. Staff engaged on an area basis would usually have responsibility for a number of schemes of relatively short duration and would travel to new and existing sites within their particular district. Major new hospital building sites would have resident Clerks of Works and Site Engineers, where they could be involved for several years.

At the time of peak construction activity the site supervisory staff numbered in excess of thirty. Their role was to remain integral to the NHS until privatisation of the design function in 1996.

COMMISSIONING OF ENGINEERING SERVICES

The engineering services associated with hospitals are often highly complex. In addition to the usual space-heating and electrical installations, many hospitals also require other services such as steam for catering, laundry and sterilization, piped medical gases and vacuum systems, air-conditioning, clinical waste incineration and standby power generation.

The NHS in Wales is one of the few regions of the Health Service to have specifically designated a team of engineers with the prime function of witnessing the testing and setting to work of mechanical and electrical systems by installing contractors. Established by WHTSO in the mid 1970s the team is led by a professional Commissioning Engineer, to prove the design intent for completed engineering works. Specialist knowledge and a range of testing instrumentation is brought to bear in the investigation of problems associated with plant installations which, in practice, can often fail to perform to the users' expectation.

The accumulated experience and expertise has made a highly beneficial contribution ranging from feedback into future designs through to specialised information for health bodies in respect of engineering systems for which they have operational responsibility.

The commissioning documentation produced by the team records the range of performance parameters for the whole extent of hospital engineering plant. This information is of inestimable and continuing value to the hospital engineer in achieving and maintaining optimum plant performance.

The contribution made by this team in the highly specialised and demanding arena of operating theatre air-conditioning has been of outstanding merit. Drawing on long experience and a thorough understanding of air-conditioning and its application in hospital ultra-clean areas, the published guidance produced is essential reading for the design engineer, maintenance engineer and engineering manager. The provision of the service is part of Welsh Health Estates and is currently heavily engaged in the commissioning of engineering installations at the new Royal Glamorgan Hospital.
SPECIALISED ASPECTS OF THE ESTATE

X-RAY AND DIAGNOSTIC IMAGING ENGINEERING

The application of X-ray technology was to expand rapidly in the early years of the NHS. The extensive provision of chest clinics and the growth of mass radiography as part of the medical offensive against the ravages of tuberculosis, had already demonstrated the need for X-ray equipment expertise in support of chest physicians and their staff. Investigation by radiology was to play an increasing part in the diagnostic process particularly as advancements and improvements in image intensification, contrast media and blood vessel catheterisation, were made during the 1950s.

It was soon recognised that specialised technical staff would be required to liaise with the radiologists, radiographers and engineering staff of hospitals, in respect of the selection, purchase, installation and commissioning of X-ray plant and equipment. Reacting to the need, the Welsh Hospital Board quickly established the capability. Extending from the specialist support given to design and consulting engineers preparing hospital schemes which included X-ray and diagnostic imaging departments, the work embraced advice and assistance to hospitals in establishing departmental refurbishment programmes and estimates of expenditure.

In view of the high capital cost of X-ray equipment, the scientific and technical branch of the Ministry of Health established from 1948, a liaison service with the specialist manufacturers, including works inspection and checking of all newly delivered equipment. This role in respect of the NHS in Wales was passed in 1982 to the Works Directorate of WHTSO. Inspection work was also extended to include the survey and technical appraisal of all installed X-ray plant throughout the Principality. This task entailed reporting on the condition of all static and mobile equipment, advising on the need for replacement and preparing a recommended programme.

The technology of X-ray and diagnostic imaging has developed rapidly and become increasingly sophisticated with the emergence of computerised tomography scanners and the application of ultrasound and magnetic resonance imaging methods. Advances have also been made in the field of radiotherapy ranging from the early use of radioactive isotopes and gamma ray emitting sources to the development of X-ray linear accelerators.

It is interesting to note that the underlying philosophy of mobile chest screening used as part of mass radiography in the early NHS, has been repeated in the present day mobile mammography screening undertaken by Breast Test Wales.

Although the reduction in the hospital capital building programme has reduced the opening of new diagnostic imaging departments, the combined requirements of advances in technology, refurbishment and replacement, have sustained a continuing need for specialist advice on the selection, procurement and installation of equipment, which continues to be provided by Welsh Health Estates.

LAND AND PROPERTY MANAGEMENT

As holders of a substantial estate, the NHS in Wales has drawn heavily on the professional support of building surveyors, particularly in respect of the acquisition, development and disposal of land and buildings. First formed as a small group within the Architects’ Division of the Welsh Hospital Board, the section eventually joined other specialised support services as part of the WHCSA EstateCare Services and ultimately Welsh Health Estates. In providing health care managers with the highest standards of advice in all land and property matters, the service has since its inception enabled health authorities to obtain maximum value from the estate consistent with Welsh Office and government directives.

Surveys of prospective sites for health care buildings extend to investigating Town and Country Planning implications, site geology, natural hazards such as flooding, possible consequences of mining and mineral working, road access, restrictive covenants and other relevant factors affecting ownership and valuation. Practical surveying also includes the use of closed circuit television for the internal examination of drainage and other inaccessible voids.

Protection of the estate has included investigating ownership, conditions of leasing and tenancy, encroachment, trespass, identifying easements, rights and restrictions to be granted or retained and all matters affecting the interest of public ownership.

The work involved in both disposal and acquisition includes active liaison with the District Valuer in terms of valuation and methods of
disposal and with estate agents and solicitors in respect of conveyance. Work associated with disposals has intensified in recent years as the rate of hospital closures has increased. NHS Trusts are free to sell land and other assets subject to certain restrictions. The Secretary of State has reserved power to prevent disposal of property where this would be against the interest of the NHS. This power applies only to assets valued at £1 m and over. Trusts have to notify Welsh Office of planned disposals in their business plans and any private finance initiatives.

The land and property information records of the early NHS were held in the traditional form of estate terriers. As a consequence of the limitations of this form of record and the accumulation of additional data being added in the form of Ordnance Survey maps, plans attached to legal documents and aerial photographs, it was realised that this wealth of information could be best compiled and presented in a more cohesive form. From such considerations there emerged the Land and Property Portfolio of the Welsh NHS Estate, conceived by G. S. Randall, Estate Surveyor, which is now recognised as exemplary in the field of estate management. EstateCare Services was later to be commissioned by Cadw Welsh Historic Monuments to produce a similar portfolio of their extensive estate of ancient and historic sites throughout the Principality.

Originally conceived as a series of hard copy manuals providing a comprehensive plan and data record of each hospital, health centre, clinic, ambulance station, communication aerial site and other properties held by each health authority, the LAPP has evolved into a computerised Land and Property Information System. In this form it can provide a macro level input to computerised asset management and information systems utilised by hospital estate departments.

STERILIZER ENGINEERING

To appreciate the engineering contribution to the prevention of infection, it is necessary to understand a little of sterilization, a process which eliminates all viable micro-organisms in the material treated. The word really means what it says, and describes exactly what is checked by the bacteriologist when testing the reliability of the process used. Bacteriological testing of sterility implies supplying an adequate nutrient medium, incubation at an appropriate temperature under suitable conditions and demonstrating that the bacteria have been rendered sterile, i.e. they have lost their ability to propagate. The process of sterilization is complex and acceptance of sterility is highly dependent on confidence in the reliability of the method used. Confirmation of effectiveness is not immediately apparent.

Micro-organisms differ enormously in their toughness. The vegetative forms of most bacteria, fungi and viruses are sterilized within five minutes of exposure to a temperature of 70°C. Some bacteria are killed by as low a temperature as 47°C for a few minutes, while others survive 60°C for more than an hour. Many species of bacteria, however, give rise to endospores. Spores are not apparently a device for reproduction but a form of the organism adapted to resist extremes of heat and cold, dryness and toxic chemicals. Thus sporing organisms are much more difficult to kill by boiling or chemical disinfection. Whereas vegetative organisms are killed by immersion in boiling water for relatively short periods of time, the spores of some organisms can resist such conditions for hours. Spores are also, in general, considerably more resistant to chemical agents.

Disinfection and pasteurization are often incorrectly regarded as synonymous with sterilization but may refer only to the inactivation of specific pathogens. For example, the pasteurization of milk by heating at 62°C for thirty minutes depends on the fact that the common pathogens in milk are non-sporing and easily susceptible to this level of heat exposure. Boiling water disinfectors were extensively used in the early NHS for processing surgical instruments. While such use was highly convenient it was only a makeshift method since, even at its best, it failed to kill all bacterial spores. Their use has long since been actively
discouraged. While the spores of some pathogens are indeed destroyed within five minutes at 100°C, the risk of cutting-down or failing to measure the essential exposure time, is high.

The process of sterilization by the autoclave utilising steam under pressure, is designed to defeat the heat resistance of spore bearing organisms. Steam is an ideal medium for sterilization in that, at modest pressure, it provides elevated temperatures with a wealth of latent heat energy which at or just below its saturation point, readily gives up as it condenses on surfaces colder than itself. It thus provides that element of moisture necessary to penetrate the thick cell walls of spores and the heat required for coagulation of the cell structure. The irreversible bactericidal effect of steam is well established in biological thermal death criteria of temperature and exposure times applying to the most resistant of spores. Various combinations of time and temperature may be used, provided that it has been satisfactorily demonstrated that the process delivers an adequate level of lethality when operated routinely within established tolerances. The choice of 134°C for 3 minutes, 121°C for 15 minutes or 115°C for 30 minutes is typical in practical use dependent on the likelihood of any physical damage to the item being sterilized arising from too long an exposure to heat.

On the face of it, the exposure of items to steam within an enclosed chamber, would appear to be a relatively simple matter. There is a grave danger, however, that the seeming simplicity of the function could lead to the completely false view that sterilizers are in themselves simple pieces of equipment which are easily operated and maintained. In fact, physical factors make the process far more demanding. Any load to be sterilized will initially be surrounded by air within the chamber which in simple terms will be displaced by a flow of steam under pressure. Air is, however, one of the most effective insulators encountered in nature, and at a microscopic level can form a highly effective insulating cocoon around any micro-organism. While there is a possibility of this happening due to residual air on the impervious surface of metal bowls and instruments, it is even more likely within the porosity of surgical dressings and various other textile items. Modern porous load sterilizers are equipped with highly efficient vacuum pumps that not only remove the initial air content but repeat the process of extraction by alternating with steam flushing. This is designed to ensure the removal of any last vestige of air and a high degree of vacuum prior to the load being held under steam pressure at the desired temperature for the necessary time. In addition, this type of sterilizer is equipped with an air detecting device and a leak test facility, to ensure the integrity of the machine against the ingress of air under vacuum conditions.

The quality of the steam supply is also critical to the process. It is self evident that the presence of air or any non-condensable gases in the steam must be at an absolute minimum, and any fine water particles being carried in the steam must be removed. Such particles carry no latent heat and when deposited on the surface of packed dressings will only wet the exterior and prevent the proper penetration of steam into the centre. Above all else, the steam must not be superheated. It must not contain more heat than is necessary to be at the saturated condition. In practical terms, the steam must still be moist. While superheat may damage the load, more importantly the lack of moisture will prevent sterilization at that temperature, the chamber becoming in effect a hot air oven. Dry heat requires a much higher temperature and considerably longer periods of exposure to ensure lethality, typically 160°C for over 1 hour.

Over the years of the NHS, the steam sterilizer has been as complex and as costly as the application of contemporary technology would allow. In order to increase the assurance of the repeated achievement of sterilization, the modern state of the art steam sterilizer is an electro-mechanical machine of sophisticated design utilising not only the long established principles of steam engineering but also employing advanced electronic instrumentation and control systems including programmable logic devices and microprocessors. Confidence in the consistent achievement of sterile products relies heavily on experienced operators monitoring all the outward indications of correct
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machine operation. The eventual concentration of production in Central Sterile Supply Departments and Hospital Sterilizing and Disinfection Units, was to contribute greatly to the control of quality.

The engineering maintenance of sterilizers requires not only the necessary practical skills but also demands a thorough knowledge of the process and how this is achieved by the operational cycle of the machine. Above all, an appreciation is required of the effect of any control adjustments particularly where these may change the parameters of the sterilizing process. It is essential that all who undertake such maintenance have this level of competence whether they be the staff of hospital works departments or of external contractors.

The requirement for annual testing of all sterilizers followed the recommendations of the Clothier Committee Report, published in July 1972, which enquired into the circumstances surrounding the death of nine NHS patients through the use of improperly sterilized intravenous fluids produced by a commercial pharmaceutical company. Such testing should be done to measure conditions at multiple points within representative loads using external thermometric instrumentation of a standard of accuracy higher than that employed to control and indicate sterilizer parameters.

The professional and technical staff engaged on this work within the NHS in Wales rapidly built up a high level of specialist knowledge and experience in both the application of instrumentation and testing techniques in what was then a relatively new field. This was to extend to making a leading contribution to the extensive revision of the Health Technical Memorandum on Sterilizers published in 1980. Testing methods were also developed for a limited number of specialised sterilizers that used formaldehyde gas in low temperature steam (below atmospheric pressure) and Ethylene Oxide gas, as the sterilizing agents. Testing was also undertaken to verify the efficiency of culture media preparators and the steam sterilization of laboratory discard in pathology laboratories.

By 1985 testing was carried out on behalf of all health authorities on over 400 machines throughout Wales. Advice and support was also provided in order to ensure that national standards in respect of sterilizer specifications and installation requirements were fully complied with. Although on-going as an important estate function, the task is much reduced due to the rationalisation of facilities and the diminishing of in-service sterilization, particularly of pharmaceutical products, as the emphasis has moved to the use of bought-in sterile goods and disposable products. Welsh Health Estates currently provides the services of the Authorised Person “Sterilizers,” who under the recommendations of the latest Health Technical Memorandum, has the duty to validate sterilizer technical specifications and testing.

The importance of the work to patient care is highlighted in extracts from the Clothier Committee Report that are as valid now as they were in 1972: “The cause of this disaster is to be found in human failings... ranging from simple carelessness to poor management of men and plant... Too many people believe that sterilization is easily achieved with simple plant operated by men of little skill under a minimum of supervision... Safety depends ultimately on untiring vigilance”.

BUILDING REGULATIONS AND FIRE PRECAUTIONS

The closely related disciplines of building regulations and fire precautions have long presented a complex and difficult scenario of operation for the NHS. For many years before the removal of crown immunity the Service had observed and applied the spirit of fire precautions legislation and the requirements of the building bye-laws. The architectural responsibility for the compliance of new building design drew support from the work of both fire officers and building control officers within the NHS. Fire precaution advice in respect of new health care buildings was subject to the recommendations of the Home Office Fire Inspectorate. Schemes were also submitted for local authority
fire brigade observations on a good will basis and officers of the fire service were invited to visit hospitals and report informally on all aspects of fire precautions. It had been felt for some time, however, that agreed standards were necessary for the designers, users of buildings and the vetting authorities, since it had been found by long experience that requirements varied considerably across the country.

Following the tragedy of the Coldharbour Hospital fire in 1972, a multi-disciplinary working party on fire precautions was set up within the NHS in Wales. The initial aim was to analyse the scale of the fire precaution problem in the hospitals of the Principality, particularly in the long-stay sector, and to review the upgrading of older accommodation to see if the same conditions that had contributed to the Coldharbour fire, were replicated in Welsh hospitals. The work of this group was to contribute interim provisions prior to the emergence of national guidance that, eventually, was to be reviewed and revised in successive editions of Health Technical Memoranda and culminate in the present day NHS Estates’ Firecode documentation.

Building Regulations came into operation in 1966 with the advent of the Building Control Authority. Although the Regulations were not binding on hospital authorities, it was Government policy that the standards generally should be observed throughout the Health Service. Furthermore, the Health and Safety at Work Act of 1974, applied the technical requirements of the Building Regulations (but not the procedural requirements) to the NHS. These developments drew the work of fire precautions firmly into the arena of the Building Regulations. The 1971 Fire Precautions Act had also influenced the way fire certification applied in the office and factory elements of NHS buildings but excluding patient areas. A Code of Practice did however apply to all health care areas not requiring certification under the Act.

The work of the Building Control Officer within the NHS in Wales assumed even greater importance with the removal of crown immunity in 1991. The advice to health authorities not only included the way standards and legislation applied to new buildings but also how the requirements were modified by the variety of usages found in health care premises and the extent to which relaxations and dispensations applied in the improvement of older buildings.

The Fire Precautions (Workplace) Regulations 1977, have produced yet another shift in requirements, by placing the emphasis on fire audits and the need for health authorities to undertake the risk assessment of health care buildings prior to certification by the local authority fire brigade service. This has intensified further the demand for the specialist knowledge of the Building Control Officer in assessing all aspects of fire prevention and precautions in health care buildings, of which such aspects as fire and smoke barriers, compartmentation and means of escape are but typical examples.

Fire precautions have had significant impact on building design. Architectural designers are often faced with reconciling the requirements for ease of escape, containment of fire and the maintenance of personal and property security, conflicting demands that often require considerable ingenuity in design solutions.

Quite apart from the effect of fire regulations, building control has also seen immense change in such areas as the energy efficiency of buildings, thermal insulation standards and environmental considerations.

ENERGY

Present day generations understand very well the need to conserve energy although many will have only known the comfort of a centrally heated and air-conditioned environment where the supply of electricity is almost taken for granted and gas and oil predominate as primary fuels. The high cost of energy ensures an awareness of the need for economy even if publicity regarding environmental damage resulting from excessive consumption does not have the same force of persuasion.

It may therefore be difficult for many to appreciate today that the hospitals entering the National Health Service in 1948, had all been built at a time when coal and steam ruled supreme in industry and open coal fires were still the prevalent source of heating. Indeed, the situation was not much changed at the birth of the NHS. In 1948, the long Nightingale Wards of Morriston Hospital, for example, were heated by two or three coal stoves arranged along their length.

The Ministry of Fuel and Power had declared in 1944 that “the effective use of fuels of every kind is of vital importance now and will continue
to be essential to the country's well-being so long as we are dependent on coal for our heat and power". The immediate motivation for fuel efficiency was somewhat more evident in the preface to the 1944 HMSO publication The Efficient Use of Fuel which declares "...there is a danger that the supply of fuel will be inadequate to maintain industrial activity to its fullest extent and, as a consequence, the vital supply of munitions will be interrupted...".

The austerity of post-war Britain did ensure that there was some continuity in the drive for efficiency. The same HMSO publication reprinted in 1948 adds a further aspect of fuel conservation "...as a long term policy affecting a national asset of irreplaceable raw material...". The reserves of indigenous coal were also beginning to be questioned based on the 227 million tons per annum being mined in 1938. It was pointed out that "...the most important aspect of the coal question for Great Britain is not so much how long can our reserves last, but how long can we continue to get the available coal at a cost which shall not place us as a nation at a disadvantage relative to our nearest competitors. The answer is...possibly some 50 years or less. A shortage of certain special types of coal, such as coking coals, may well be experienced within the next two generations...".

The use of oil fuel was also growing and had received impetus during the war. Advances in the technology of fuel oil burners enabled the use of heavy fuel oil available as a residual by-product of the production of petrol and light oils. The use of fuel oil for steam raising purposes had many advantages and few disadvantages, providing a reliable supply could be obtained at a thermal unit cost equivalent to that of coal. The average calorific value per unit weight exceeded that of coal, giving a relative heating value in the ratio of 1.5 to 1. Oil was seen as an attractive fuel having none of the handling, trimming and stoking requirements of coal nor the subsequent disposal of ash and having less intensive labour requirements. As a generally more consistent fuel it also had improved combustion efficiency.

A continuing momentum of improvement in energy efficiency was not to be maintained as economic conditions improved. Lest it be thought that this was a problem specific to the operation of engineering plant, it should be appreciated that those responsible for the operation and management of energy distribution systems and boiler plant, were well aware of the need for efficient thermal operation. Engineers and boiler attendants in hospitals were no exception to the general rule that engineering managers and operators took great pride in achieving the highest possible thermal efficiencies demonstrable by boiler tests. Figures well in excess of 70% were aimed for, depending on the type of boiler and fuel used. The greatest loss in steam raising plant is due to the heat carried away with the waste products of combustion. The use of Economisers to recover a proportion of this heat and return it to the boiler feedwater, was widespread in hospitals well before the advent of the NHS. Heat distribution systems were generally well insulated and designed for efficiency with a high proportion of the sensible heat content of steam condensate being recovered by way of return to the boiler feedwater hot well.

While there always will be the need to sustain good engineering design and maintenance practices, by far the greatest scope for improvement in energy conservation lay then, as now, in the overall thermal efficiency of buildings and good housekeeping in the use of energy in its various primary and secondary forms.

At the present time, when the use of steam may be less in evidence in some hospitals, there may be some who have come to regard its use as a relic of the past or indeed of the industrial revolution! It is true to say that over the years, there has been a complex change in the pattern of energy use in hospitals. The reduction in steam utilisation in some hospitals, even large DGHs, has resulted in the main steam boilers being replaced by low pressure hot water boilers. The reduction of laundry capacity, the preference for gas and electricity for catering and kitchen purposes and, to a lesser extent a contraction in steam sterilisation, have all contributed to this change. In such cases, a continuing requirement for relatively limited quantities of steam for sterilisation is met by the use of small steam generating units.

The properties of steam in relation to the conveyance of heat over large areas, albeit with good standards of insulation, are as valid now as they ever were and its use in large hospitals is founded on sound thermodynamic principles. Steam is a simple and relatively cheap form of energy carrier and possesses many outstanding qualities. It is easily controlled, readily distributed and has a very high heat content that allows a comparatively small steam pipe to carry a great amount of energy. It gives up its heat at constant temperature when it condenses.
For example, steam at atmospheric pressure can give up five-sixths of its heat without any drop in temperature. It can first generate motive power and then be used for heating, or its heat can be abstracted in successive stages by lowering the pressure. Steam was described by Sir Oliver Lyle of Tate and Lyle fame as “...Industry’s most wonderful, flexible and adaptable tool...”.

Reference has already been made in Chapter 4 to the Welsh Hospital Board’s programme of boiler replacement. The priority given by the Board to this aspect of hospital improvement is amply illustrated by a review of what had been achieved by the end of 1972. Of a total of 210 steam boilers operating within the Welsh hospital estate at that time, only 25 pre-dated 1948; 67 had been installed in the 1950s and a further 72 in the 1960s. It is a reflection of the improvement in the financial resources becoming available, that a further 46 had been installed in the three years prior to the end of 1972. All were shell boilers with 154 being of a modern Economic fire-tube type, the majority of which were of a single furnace tube three pass design having evaporating capacities ranging from 1,000 to 20,000 lbs of steam per hour. Vertical boilers of the cross-tube or fire-tube variety totalled 42, most having evaporative capacity near to or below 1,000 lbs per hour and usually installed in smaller hospitals requiring smaller quantities of steam.

Notably, there still remained 14 Lancashire boilers, a type which had been for many years the mainstay of the shell-boiler industry and which had its origins in the mid Nineteenth Century as an improvement on the Cornish boiler. Differing distinctly from the Economic type by not having internal fire-tubes, the Lancashire boiler utilised brickwork flues external to the boiler shell as part of the heat transfer method. The Lancashire boilers were amongst the oldest hospital boilers remaining in operation in Wales; the three at St David’s Hospital, Cardiff, dating from 1909. The Board had installed three Lancashire boilers at the North Wales Hospital, Denbigh, as late as 1956. Although this may seem surprising in view of the old-fashioned design, it is acknowledged that the Lancashire continued to be popular at that time despite the arguments in favour of tubular boilers.

Heavy fuel oil had already taken over from coal as the preferred fuel with 116 boilers being so fired; a further 18 boilers used oil of a lower viscosity and 64 were coal fired. A further 12 boilers had been installed or converted to burn natural gas with oil as an alternative stand-by fuel allowing the advantage of an interruptible gas supply tariff. Examples are the former coal fired Economic boilers converted at Llanelli Hospital and those installed at Cefn Coed Hospital, Swansea, replacing coal fired Lancashires. Further gas conversions followed during the 1970s including the oil fired boilers at Nevill Hall Hospital, Abergavenny.
Coal was clearly in decline as a fuel for steam raising in Welsh Hospitals. By the late 1960s, there was evidence of a deterioration in the quality of coals available from the South Wales coalfield, for use with mechanical stokers particularly of the low ram coking type. Other types of mechanical stokers to be found in hospitals included chain grates and screw driven underfed types.

The coking stoker gave the best results when burning fuels containing a low proportion of clinker-forming material and not excessive in ash content. The selection of a consistent and economical grade of fuel and its consumption at a rate proportionate to the grate area, heating surface and draught power of a boiler plant, were the most important factors in the successful working of mechanical stokers. When a particular grade of fuel had proved satisfactory, changes were to be avoided as much as possible. Under these circumstances mechanical stokers were very reliable, provided they were well maintained.

Problems of firing, grate life and maintenance started when the quality of fuels began to vary often due to blending in colliery washeries. Some fuels, especially those very low or very high in volatile properties, were often unsuitable for mechanical firing. A measure of hand firing still remained in 1972 and for some years thereafter. It is no simple task to fire a boiler properly, particularly by hand. The skills of those who operated and maintained coal fired boiler plant in hospitals should not be underrated.

The decline in the use of coal was, however, gradual for a number of reasons, not the least of which was the need to protect the industry and reduce the import of oil. The new boiler house at Morriston Hospital, designed before 1981 and commissioned in 1983, was to be fired by coal and use low ram coking stokers before being eventually converted to gas firing. The last coal fired steam raising boiler plant in the NHS in Wales was to be that at the Princess of Wales Hospital, Bridgend, using sprinkler stokers.

Hospital steam boiler plant requires adequate steam space giving a greater reserve and the ability to satisfy a fluctuating steam demand rather than rapid steam raising qualities. The typical hospital boiler is required to generate steam at a gauge pressure of 100 lbs per square inch but where steam was used to power the site generation of electricity the rating could be up to 250 psi. Steam pressure is reduced locally after distribution, to a pressure appropriate to the use for process or heating. Steam heating is comparatively rare in hospitals due to the dangers associated with high surface temperatures and use is restricted to industrial areas.

Low pressure hot water heating is obtained by pumped secondary circuits off steam heated calorifier heat exchangers. Domestic hot water is provided in a similar manner from larger storage calorifiers constructed in copper to withstand the corrosive action of continuous raw water. Low pressure hot water boilers continue to be used extensively for heating and domestic hot water in those smaller hospitals not justifying or requiring the use of steam. A similar pattern of improvements and changes in methods of firing was evident in Welsh hospitals by 1972. Of a total of over 450 LPHW boilers, only 42 predated 1948. Over half were fired by oil generally of the low viscosity variety; 114 remained fired by coal with anthracite being used where appropriate and 85 used or had been converted to natural gas.

In view of the considerable investment in the replacement of boiler plant, the Welsh Hospital Board had appointed a Fuel Efficiency Officer to provide support and advice to designers and HMC Group Engineers alike. Such assistance included regard to the efficient operation of existing plant and the economic use of fuel, the review of installed plant in terms of its potential life and its suitability to continue in service in relation to change of hospital use, extensions or refurbishments. Assessment was also made in conjunction with Group Engineers, of any proposed change in boiler type, mode of operation or type of fuel. Government requirements also stipulated the preparation of fuel cases in respect of new boiler plant or replacement that involved an assessment of
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the capital costs of various options and of the revenue charges that would accrue.

The Welsh Hospital Board had also initiated the design of a particularly interesting form of combined heat and power that was to be applied in a number of the new district general hospitals. The concept involved utilising back pressure steam reciprocating engines as prime movers for electrical generation and using the exhaust steam for heating and process. The arrangement was thermodynamically sound and well known in industry albeit using steam turbines. It was also true to say that there was nothing particularly new about the application of steam engines for electrical generation in hospitals.

The essential new principle was that the amount of electrical power generated was made entirely dependent on the variable demand for exhaust steam. During the normal running of the generator, synchronised in parallel with the public electricity supply, the quantity of steam entering the engine was governed by the back pressure control which modulated to maintain the desired pressure in the exhaust steam supply. The electrical power generated was therefore dependent on the demand for low pressure exhaust steam and contributed towards the total electrical consumption of the hospital. It could be said that the electrical power was generated as a by-product of the hospital demand for low pressure exhaust steam with the engine acting as a substitute for a pressure reducing valve.

An installation at Nevill Hall Hospital, Abergavenny, was designed by the Welsh Hospital Board’s own engineers and employed two twin cylinder vertical compound reciprocating steam engines operated at 120 psig steam pressure at the engine stop valve, exhausting against 7 psig back pressure to develop 200 KW (290 bhp) at 428 revolutions per minute. The engines drove 415/240 volt 3 phase alternators each of which was normally rated at 250 KVA at 0.8 power factor with automatic voltage regulation.

A case study undertaken at Nevill Hall in 1976 indicated that the generation provided 13% of the 4.4 million KWH total electrical energy demand of the hospital during the year under review. For various technical reasons that are beyond the scope of detailed explanation here, this performance was no; sustained at Nevill Hall Hospital, or indeed replicated at the other District General Hospital sites in Wales where the concept was applied.

The power output from this type of site generation was inherently variable and highly dependent on correlation with the demand for heat. In that respect the site generation could not be regarded as a package in isolation from the other engineering services of the hospital. It could also be concluded that the greatest obstacle to the economic application of this type of combined heat and power arrangement was the attempt to obtain from it the additional provision of a particular level of emergency generation in the event of mains failure. This demanded a compromise with regard to optimum engine size and a very strict control and restriction of the emergency electrical load.

It was seen from the case study at Nevill Hall that the concept could be viable notwithstanding the imperfections in application at that site identified in the study. It is therefore singularly unfortunate that the technical principles were not fully appreciated by those responsible for the design at other District General Hospitals in Wales, with the result that the installations were never part of an integrated engineering design. It is also true to say that the concept failed to attract the wholehearted support of trend leaders at senior engineering levels in the wider NHS and in this context it was before its time. The full impact of the oil crisis of 1973 had yet to concentrate minds on the need for innovation in energy technology.

None of these installations remain in use and many of these magnificent engines were eventually removed and sold. The seeming failure of the concept is particularly ironic in view of the fact that many of the design errors made at the time were to be identified as pitfalls over twenty years later in the Good Practice Guide for the Application of Combined Heat and Power in the UK Health Service prepared by the Energy Efficiency Office of the Department of the Environment in conjunction with the NHS Regional Estate Managers Group. The use of back pressure steam, albeit using turbines, is identified in the Guide as one of various arrangements for CHP.

The 1973 OPEC oil crisis was to bring about a hard reality in terms of its effect on the cost of all forms of energy. Fuel oil, after achieving a dominant position (some 40% of total consumption) in the
UK energy market during the decade from 1960, was subject to major price increases in excess of 200% during 1973-74. This increase was to be directly reflected in the prices of the other three main fuels of coal, gas and electricity. Tony Benn, as Secretary of State for Energy, was to write in 1975 “The era of cheap energy is over and it would be foolhardy in the extreme for any of us to conduct our affairs in the expectation that it will ever return. We can no longer afford, individually or nationally, the wasteful practices into which we understandably fell when supplies were cheap and abundant...”.

Energy costs for the NHS estate in England and Wales were to increase from some £27m to £120m per annum over the period 1967 to 1976, although energy consumption had fallen from the peak year of 1972-73 to be less than in 1967 despite increases in the hospital estate. By 1979 it was variously estimated that a reduction of 35% on the peak energy consumption was attainable. Although energy costs did not constitute a substantial element of total NHS revenue expenditure (3.5% in 1972-73) they were nevertheless significant in financial terms.

Government policy and statutory measures to achieve conservation were to have extensive application in the NHS. As a result of the drive for efficiency, estate officers were to become heavily involved in energy audit systems consisting of energy monitoring and targeting methods applied to hospital sites. Such methods were directed at providing an effective procedure for monitoring energy usage and a means of representing energy consumption in a form meaningful to both works and non-works staff. They were also designed to provide a practical and systematic approach to establishing energy saving targets for a site and to identify the division of potential savings between good housekeeping and investment measures. The estate officers both in Welsh hospitals and at WHCSA were active in progressing such audits at almost all major hospital sites in the Principality.

Energy performance in Welsh hospitals has been monitored against targets since 1984-85. Originally, the targets for each District Health Authority were set by the Welsh Office in agreement with local estate officers. Since 1990-91 the general Government targets set for the NHS, have been applied. In the same year, a national target of a 15% reduction was set for the NHS, to be achieved over 5 years. This was accomplished in Wales within 4 years. A further 20% reduction has been set as a UK target for the NHS, to be achieved by the year 2000. In 1984-85, the degree day corrected energy consumption of the NHS in Wales was just over 4 million gigajoules based on a heated volume of nearly 4.7 million cubic metres. By 1996-97 this had been reduced to just under 3 million gigajoules based on a heated volume of just over 4.3 million cubic metres.

For over ten years or so, the estate officers of the DHAs and the NHS Trusts in Wales, have actively pursued feasibility studies for combined heat and power installations. Hospitals have particular potential for CHP as most operate continuously and have a significant minimum base load demand for both electricity and heat. Typical small scale CHP units generate electrical power by generators driven by reciprocating internal combustion engines that have heat recovery systems. Waste heat is recovered from the engine jacket and from the exhaust gases. Such generation is run in parallel synchronisation with the mains electrical supply. It is essential that every installation conforms with the best practice recommendations in both planning and design. It is also essential that the security of the hospital electrical supply is not diminished nor the provision of stand-by power in any way compromised in the event of a main supply failure.

It is believed that there are currently twelve hospitals in Wales where a total of 24 CHP sets have been installed giving a total of nearly 6 megawatts of electrical generation. All these sets are based on reciprocating engines fuelled by natural gas.

The benefits of CHP are far reaching since it can utilise primary energy nearly three times as effectively as conventional national grid power stations. While there is a clear reduction in cost due to site generated electricity substituting for imported electricity, the inherent efficiency of the process at typically over 80% compares with centrally generated electricity at approximately 30%. Increasing the use of CHP in the NHS, as elsewhere, has the effect of reducing the energy converted at power stations; consequently there is an overall beneficial effect to the environment such as the reduction in carbon dioxide emissions. Future Governmental promotion of energy conservation is likely to be as part of the wider initiative towards improved environmental management. The NHS estate will inevitably have a part to play.
Many of the larger hospitals receive their electrical supply at high voltage (11000 volts) and in some cases the switchgear and transformers are in NHS ownership. In these latter instances, health authority engineering personnel require designation under the provisions of the Electricity Regulations as Competent Persons and Authorised Persons to work on high voltage installations. To achieve this level of competence they need to attend and pass Electrical Distribution and Safety Regulation courses, such as those provided by the Department of the Environment and the electricity distribution companies formerly Boards. For many years the Welsh Hospital Board and its successor organisations provided the service of a Chartered Electrical Engineer to act as the Authorised Engineer for high voltage installations. As part of this responsibility the Authorising Engineer had direct contact with the training centres in respect of the course performance of candidates and assessed their practical competence with regard to the particular hospital high voltage installations for which they had responsibility.

CARE OF THE ENVIRONMENT

Familiarity with health, safety and environmental protection has been of long standing within the operation and management of the health service estate. The avoidance, as far as possible, of dark smoke and particle emissions from boiler house chimneys and waste incinerator stacks, was not only a matter of avoiding the censure of the hospital's immediate neighbourhood but also an issue of pride in good operational practice long before the enforcement of pollution control legislation. It is notable, for example, that irrespective of crown immunity, all hospital pressure vessels including kitchen equipment and sterilizers, were insured with the specialist boiler insurance companies of the Associated Offices Technical Committee, albeit at a nominal indemnity, in order that such plant be subject to regular test and inspection by the independent company engineer-surveyors at the intervals laid down by pressure vessel legislation.

The United Kingdom and European legislative framework for health, safety and the environment, has grown to present the NHS estate officer with a somewhat complex arrangement of statutory regulations supplemented by obligations laid down by the Health and Safety Executive and the Department of Health. The Health and Safety at Work Act 1974 forms the broad basis on which more specific regulations and codes of practice are appended. In addition, the Management of Health and Safety at Work Regulations 1992 makes a statutory requirement for a management system for health and safety.

The hospital estate department is required not only to comply with the legislation but to assess and address risks, to minimise the environmental impact of its activities and to strive for continuous improvement in health and safety standards. Such commitment extends to the protection of all persons who might be engaged in or affected by the estate department's activities. This includes all employees of the NHS, patients, visitors, contractors and all other members of the public.

The list of legislation having an impact on the health service estate is extensive and involves estate officers in such diverse aspects as pollution control, clinical and general waste disposal, pressure systems regulations, electrical safety, radiation protection, construction (design and management) regulations and the control of substances hazardous to health. Such examples hardly do justice to the range of requirements.

Those responsible for health and safety should also be aware of relevant approved Codes of Practice a notable example being The Prevention or Control of Legionellosis issued by the Health and Safety Commission. Legionellosis, a generic term for diseases that cause fever and pneumonia, may be a relatively small problem compared to other health issues but is nevertheless an area of growing public concern. Highly publicised outbreaks such as that at the Kingston District General Hospital in 1980 and the notable case of the Stafford District General Hospital in April 1985 which resulted in the death of twenty eight people, may lead some to believe that it is a risk specific to hospitals. Such an assumption is false since all buildings that use water services and air-conditioning may be at risk.

The casual organism is ubiquitous in natural aquatic environments and has been shown to be commonly present in rivers, streams, ponds, lakes and reservoirs and on the shore of these. It causes few problems until provided with the right conditions for multiplication and dissemination. It is not surprising that the micro-organism can gain entry to the water systems of buildings and proliferate there if conditions are right, waiting for the opportunity to cause infection.
A predominant species of the legionella genus of bacteria causes the condition known as Legionnaires Disease after its identification as the agent of a major outbreak of illness following a convention of the United States Legion held in Philadelphia in 1976. At least 37 different species of the bacteria have been identified, Legionella pneumophila being the species associated with the form of pneumonia which particularly affects those who are susceptible due to either underlying illness, immunosuppression, age, smoking or a combination of these. Such categories are highly represented in hospital patients.

One of the most important features of Legionnaires disease is the non-transmissibility of the illness from person to person. Virulence and its maintenance is therefore dependent on the cultural essentials being present in the water source of the organism. Infection is acquired not by ingestion but through the inhalation of water droplets carrying viable bacteria deeply into the lungs. Running taps and shower heads produce such water droplets and the air from air conditioning systems can contain such aerosols. Fortunately, the infection is rare and most people appear not to be susceptible. The mere presence of the causal agent in water systems does not necessarily imply that disease will ensue since this only occurs if the organism is disseminated as an infectious aerosol. Colonisation and proliferation of Legionella is most likely to occur in water which is standing and at a temperature between 20°C and 45°C. Growth nutrients are supplied by other aquatic organisms and the bacterium will grow in a system supplied with mains water chlorinated to 0.5 parts per million but is susceptible to higher concentrations of free residual chlorine.

The water systems of all buildings whether they be hospitals, hotels, residential and business premises or indeed of ocean cruise liners can be found to be positive for Legionella. Because of the impossibility of removing these organisms from the natural environment, they must be considered in the design, operation and maintenance of water systems of all such establishments. Legionella bacteria may colonise the plant, pipework and fittings of hot and cold water services. In general, however, where water is stored and heated, multiplication may be avoided by keeping hot water plant at a minimum of 60°C, ensuring that at least 50°C is attainable at hot water taps (or at the entry to temperature control devices) within one minute of running water. Cold water should be stored and distributed at 20°C or below. The design and construction of water systems should avoid stagnation and materials which could encourage microbiological growth.

The prevention of infection from hospital water systems depends essentially on the maintenance of good engineering housekeeping practices. Systems must be kept clean and water treatment used where appropriate and safe to do so. Systems must also be maintained to operate safely, correctly and be subject to routine inspections. Management procedures must include staff training, good communications and record keeping, and the ability to assess the risk of contamination. Hospital estate officers have a front line responsibility in this respect and must also be able to identify systems that have a potential for creating the aerosols that can disseminate to persons both inside and outside the building.

Underlying illness and immunosuppression will always be predominant risk factors in nosocomial Legionnaires disease. The hospital estates officer will therefore remain at the forefront of preventing and controlling the risks of Legionellosis. Officers of Welsh Health Estates continue to take a leading role in UK wide research groups seeking advances in anti-Legionella technology.

**ASPECTS OF MAINTENANCE AND TRAINING**

During the 1960s the Department of Health had produced a formal system of planned engineering maintenance that was to be voluntarily and extensively adopted throughout the Service. The organisation of the system lent itself to various methods of automation since it was based on the bring-up of specified maintenance inspections and tasks to be performed at specific cyclical intervals on scheduled engineering plant and equipment. By the 1970s and into the 1980s, the organisation and management of maintenance in general could be facilitated by computerisation through a Works Information and Management System (WIMS), developed by the Department of Health as a modular collection of computer programs centred on asset management.

The works departments of almost all the health authorities in Wales were to use the various modules of WIMS on a selective basis.
planned and breakdown maintenance work requisition facility of the WIMS system was to be extended into labour management when a national incentive bonus scheme, based on work measurement, was introduced into NHS estate departments. Similarly, the asset data recording capability was utilised for the calculation of the depreciated capital values of hospital plant and equipment when capital charges were introduced as part of the NHS internal market.

WIMS had been developed in the days before the emergence of powerful desk-top computers and compatible operating systems. Attempts to support a range of hardware and software configurations proved costly, restrictive and frustrating to users. Development of a second generation of WIMS proved to be equally over ambitious and the system was eventually overtaken in the early 1990s by the advancement in computer technology and the flexibility of commercially available software.

The pattern of overall responsibility for the maintenance of electronic and bio-medical equipment in Welsh hospitals indicates a variability between estate departments and medical physics departments. The Welsh Hospital Board had developed a small section advising on the technical aspects of EBME as well as radio and telephone communication systems. The communications aspect of this work increased in importance in 1974 with the integration of the ambulance service and its radio network into the NHS. This change saw the section eventually concentrate its work entirely in the field of radio and telephone systems with an expansion into the area of radio maintenance. The section was transferred in the mid 1980s from the WHCSA Works Directorate into the Information Technology Directorate, as a result of the perceived links between communications networks and information technology.

The NHS estate has a tradition of drawing its technical staff from a variety of industrial backgrounds with, for example, most hospital engineers coming from those industries giving experience of steam raising plant and pressure vessels and many having acquired this experience in the mercantile marine service or Royal Navy. The building design and specialist technical staff of regional health authorities, also came from a wide range of both design and operational backgrounds.

The need for specialised technical training within the NHS grew with the advancing complexity of hospital buildings, plant and equipment. The establishment of the NHS Hospital Engineering Centre at Falfield, Gloucestershire, was to provide a range of specialist technical and management courses of high quality at a reasonable cost. Unfortunately, recent years have seen a drive towards the self-financing of such institutions resulting in a subsequent contraction in both the availability and uptake of training as higher costs apply at a time of reduced training budgets.

Some estate officers will recall the management courses commenced in the 1960s, initially at Keele University, Staffordshire and later at the Hospital Engineering Centre, which were run under the auspices of the Department of Health and the Institute of Hospital Engineers. The Institute founded in 1943 with representation from Wales at the forefront, was later to become the Institute of Hospital Engineering. During the early 1990s, following the trend towards unified estate management, it became the Institute of Healthcare Engineering and Estate Management embracing all the estate disciplines within the wider health care industry.

The Welsh Hospital Board and the all-Wales organisations that succeeded it, employed University and Polytechnic based students for the industrial training integral to their academic courses, such young people being regarded as potential recruits to the estate function within the health service generally. Apprenticeships were also awarded for training in building services design. NHS estate staff in Wales have always been encouraged to achieve and enhance their technical qualifications. Particularly notable is the encouragement given to staff to achieve professional status as Registered Architects, Chartered Surveyors and Chartered Engineers.

Paradoxically there was never any significant movement of estate staff between the operational departments at health authorities and the all-Wales level despite close working relationships. The first noteworthy exception was the appointment of H.F.H. Dolling, one time Superintendent Engineer to the Glantawe Hospital Management Committee as Deputy Engineer and subsequently Engineer to the Welsh Hospital Board. This was to be followed in later years by the appointment of J.I. Cook as Chief Engineer of WHCSA from his post

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SPECIALISED ASPECTS OF THE ESTATE

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as District Engineer at South Tees Health Authority. The exceptional circumstances of the 1974 NHS reorganisation did, however, see four senior officers of the former WHB appointed as Chief Works Officers to the new Area Health Authorities in the Principality.

The health authorities in Wales had from the inception of the NHS trained a limited number of building and engineering craft apprentices. By the mid 1960s the NHS throughout the UK was finding it difficult to recruit engineering craftsmen of the requisite quality. Consequently, in 1972 the Department of Health and Welsh Office issued a memorandum introducing a national 4 year apprenticeship scheme for mechanical and electrical craftsmen within the NHS, the training to be undertaken by health authorities and financed at regional level. Apprentices were to be trained in the first year at Engineering Industry Training Board approved centres and thereafter follow the skill and training specifications embodied in the EITB Module Training System leading to the award of the Certificate of Craftsmanship.

In the twenty years between 1972 and 1992, recruits made up of 106 electrical and 91 mechanical apprentices were trained under the scheme in Wales with 155 achieving the award of the EITB (later the Engineering Training Authority) Certificate of Craftsmanship. While the organisation of training was very much in the hands of hospital engineering officers, co-ordination of the EITB procedures was undertaken at the all-Wales level by an Authorised Officer accredited by the EITB to advise on recruitment and approve module completion by individual apprentices.

Approximately two thirds of the output of the scheme was recruited into the NHS as craftsmen. An interesting outcome of the flexible policy adopted in respect of the school-leaving qualifications expected of entrants was that, while almost all were subsequently able to achieve technical qualifications commensurate with their practical training, a number achieved higher qualifications enabling them to eventually become technicians and engineers. The products of the scheme are now not only to be found as craftsmen in hospitals here in Wales but also in hospitals and industry throughout the UK. A number have become hospital engineers and a few have achieved senior engineering status both in the Health Service and in industry at large.

Many will regret the gradual demise of the scheme as a consequence of organisational changes in the NHS, the growth of contract maintenance and a lack of finance. It cannot be denied that the scheme provided practical training of a high quality in some parts of Wales, particularly the more rural areas where such opportunities were very few.

In 1948 the NHS inherited a dilapidated collection of buildings, many in dire need of improvement and repair. This was due, in the main, to nearly a decade of understandable and enforced lack of maintenance during the war years and their immediate aftermath. Over fifty years the condition of hospital buildings has improved out of all recognition. There yet remains the danger that during times of financial stringency the maintenance of both building fabric and engineering services is an easy option for postponement and delay. It is in this context that failure to take early remedial action and sustain planned programmes on such basic maintenance as painting and decorating, can easily lead to visual evidence of disrepair and increased future costs.
What then does the future hold? At this fiftieth anniversary considerable uncertainty remains in respect of a future strategy for the NHS in general and for the provision and maintenance of the estate in particular.

In Wales, the organisational structure remains in a continuing state of change. The Commissioning Health Authorities have amalgamated to become less in number, and while some Trusts have already joined with neighbouring Trusts, others are now required to do so by government policy. Such amalgamations are not necessarily free of controversy. While on the one hand they are often opposed on the grounds of a loss of local autonomy, they are, on the other hand, seen as in accord with a climate of antipathy towards quasi autonomous bodies often perceived as unrepresentative of the population at large. There are potential advantages, however, in the management of the estate of larger Trusts due to economies of scale.

The Welsh Health Common Services Authority is scheduled for dissolution in the Spring of 1999. The future arrangements for its constituent departments, including Welsh Health Estates, have not as yet been made public.

The establishment of the Welsh Assembly and its adoption of responsibility for the overview of health care in the Principality is unlikely to leave the NHS in Wales untouched by further change in emphasis if not in organisation.

While advances in clinical technology will undoubtedly continue, the demands posed by new, virulent and drug resistant diseases may yet prove to be a considerable threat. It is not inconceivable that society may face a challenge not unlike that posed by infectious diseases and tuberculosis in the first half of the twentieth century.

The present day pattern of hospitals has largely been reactive to the needs of health care over the past fifty years. It is on this provision and the sustained ethos of public service, that esteem for the NHS is well founded. It cannot be denied, however, that in society increasingly uncertain of its values of collective solidarity, widespread doubt is expressed whether the NHS can be retained in its present form. Whatever alternative system evolves, the health care problems of the future will to a large extent mirror the problems of the past. The diseases of poverty have been replaced by diseases of affluence derived from changes in lifestyle, nutrition and the environmental impact of present day industrial activity.

The NHS estate and its staff are principle resources for health care and the estate management function, at both national and hospital level, is an essential complement to patient care. Much has been achieved over the fifty year existence of the NHS. The requirement for good estate management is there to continue, only the form and structure of its provision remains uncertain as the NHS evolves to meet the challenges of the future.
APPENDIX A

1948 - 1974

HOSPITAL MANAGEMENT COMMITTEE
NEWPORT AND EAST MONMOUTHSHIRE
NORTH MONMOUTHSHIRE
RHYMNEY AND SIR HOWY VALLEYS
BRECON AND RADNOR/THE BORDER COUNTIES
CARDIFF/CARDIFF NORTH AND DISTRICT/CARDIFF AND DISTRICT
UNITED CARDIFF HOSPITALS/UNIVERSITY HOSPITAL OF WALES
MERTHYR AND ABERDARE
PONTYPRIDD AND RHONDDA
MID GLAMORGAN/BRO MORGAN/GWINT
WEST WALES/SOUTH WEST WALES
MID WALES
CAERNARVON AND ANGLESEY
CLWYD AND DEESIDE
WREXHAM, POWYS AND MAWDDACH
VALE OF WVRD
WHITCHURCH AND ELY
MORGANNWG
CEFN COED
CARMARTHEN MENTAL
WELSH BORDER
NORTH WALES MENTAL

GROUP ENGINEERS
T.H. PLATT
W.H. HEIGHWAY
D.V.M. GIBBON
W.L.C. BROWNING
G.H. BROWNING
D.W. MOORE
G.JONES
W.HAINES
P.JACKSON
D.FORBES
D.V. CUMMINS
H.SALT
P.THORNE
E.DYER
C.J. ARNOLD
H.FH. DOLLING
C.M. THOMAS
D.G. WILLIAMS
T.E. EVANS
J.M. MORRIS
J.J. DAVIES
F.R. WILSON
M.C. PRATT
R.N. DAVIES
N.C. COY
C.J. ARNOLD
W.G. OWEN
T.W. BARNFATHER
D.V. CUMMINS
H.L. KLEYERLAN
J.T. HUDSON
F.W. WILLIAMS
T.H. BRYANT
R.G. PRITCHARD
M.C. PRATT

BUILDING SUPERVISOR
F.F. YEATES
E. DAVIES
E.E. EDWARDS
G.H. CORNISH
A.C. VAUGHN
G.H. CORNISH
G.W. ROBERTS
R.G. SAGE
I.J. DAVIES
H.P. EDWARDS
G.H. CORNISH
G.W. ROBERTS
P.A. H. GREY
P.A.H. GREY
R.G. PRITCHARD
M.R. WAITE
R.G. PRITCHARD
P.A. H. GREY
M.C. PRATT
M.C. PRATT

APPENDIX B

WELSH REGIONAL HOSPITAL BOARD
ARCHITECT
D.G. WALTON
J. LEIGH
ENGINEER
H.R.H. WARD
H.E.H. DOLLING
E.A. JOHNSON

DEPUTY ARCHITECT
W.H. CALLARD
W.H. SIMPSON

DEPUTY ENGINEER
H.F. HENDERSON
H.F. HENDERSON

QUANTITY SURVEYOR
P.T. JOHNS

WELSH HEALTH TECHNICAL SERVICES ORGANISATION/
WELSH HEALTH COMMON SERVICES AUTHORITY
DIRECTOR OF WORKS
D.P. PICKUP
J.E. MEIK
N. KIRK
J.I. COOK

CHIEF ARCHITECT
W.H. SIMPSON
N. KIRK
A.C. MURRAY

CHIEF ENGINEER
E.A. JOHNSON
R.G. KENNET
C.H. DOBSON

CHIEF QUANTITY SURVEYOR
T.P. JOHNS
P. COOME
P. RIORDAN

CHIEF PROJECT ADMIN.
R.D. HEWITT
G.F. HYATT

APPENDIX C

FORMATION OF AREA HEALTH AUTHORITIES 1974 - 1975
CHIEF WORKS OFFICERS
CLWYD
M.C. PRATT
DYFED
I.J. MORRIS
GWENT
J.HENDERSON
GWYNEDD
A.J. HARDY
POWYS
W.G. RICHARDS
MID GLAMORGAN
F.W. WAITE
SOUTH GLAMORGAN
PAH. GREY
WEST GLAMORGAN
J.L. TAYLOR
SELECT BIBLIOGRAPHY

Chaplin, Norman - The Institute of Health Service Administrators. Getting It Right? The 1982 reorganisation of the National Health Service. IHSA 1981.


Levitt, Ruth and Wall, Andrew. The Reorganised National Health Service, Crom Helm Ltd. 1976.

Ministry of Health. Hospital Survey: The Hospital Services of the North Western Area, HMSO. 1945.


Rivett, Geoffrey. From Cradle to Grave Fifty Years of the NHS, King's Fund Publishing. 1998.


The Institute of Hospital Administrators. Modern Hospital Management, IHA. 1969.

(Edited by J. F. Milne and N. W. Chaplin).

Welsh Board of Health. Hospital Survey: The Hospital Services of South Wales and Monmouthshire, HMSO. 1945.


