

# HOSPITALS

## THEIR HISTORY & DEVELOPMENT

PART (1) OF THESIS "A MODERN HOSPITAL"

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AN ESSAY; SUBMITTED IN MODERN ARCHITECTURE - - BY RICHARD F. TAYLOR - - MARCH '36

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## PRE-CHRISTIAN HOSPITALS

Opinion varies greatly as to the exact date that hospitals as institutions for caring for the sick were first used by man. Christians and Jews alike proclaim the birth of the modern institution to have taken place with the life of Christ and to be the work of their respective hands.

One needs but to read pre-christian history to find the work of the hospital was carried on in many ways previous to the Christian Era. True enough the conception in those early times was crude but the actual existence of such institutions can hardly be doubted.

To support these beliefs let us first go back to 4000 B.C. whence there existed the Temples of Saturn. These temples in their earliest form are recorded as medical schools. It is true that these buildings did not carry on all the functions of our modern medical center; to be exact they probably only carried on the teaching of the medical profession. However, we must remember that today the education of the medical student by the hospital is considered one of its four important functions.

In 1100 B.C. it is recorded that a college of physicians in Egypt received public pay and were ruled by law as to the extent and nature of their practice. No building is mentioned in this instance but the work of the hospital, the germ of the idea, is very much in existence.

History next takes us to Greece at the beginning of its charm and culture. One writer expresses it, "as early medicine was sacerdotal, the first organized institutions for the care of the sick were established in connection with temples." Such examples are the temples of Aesculapius established at Cos, Cnidus, Rhodes and Epidaurus. Strabo is quoted as saying, "they were filled always with patients and along their walls were recorded on tablets the treatment and history of individual cases of disease."

In time a differentiation among the priests of these temples took place and some of them became concerned chiefly with the ministrations to the sick.

Julia Holmes Smith in the Medical Counselor (1850) quotes from Aristophanes the comical illustration of the very questionable character of these priestly physicians. "A slave, sorely sick, came to the temple, with many others, bringing votive offerings of wine, figs, bread, etc. These offerings were hung about the altar of the god, and the patients bidden to wait outside the curtain until, in the darkness of the night the god came, appropriated his fee, and left with the priest the healing drug. Hearing a sound in the stillness of the night, the slave peeped through an opening in the curtain, and saw the priest emptying, one after another, all the offerings into a sack which he carried in his hand. Tired and hungry, the example was too much for the patient; a fragrant posset was near him; he seized, drank, and we dare assume was healed although the poet does not say so."

Army surgeons are reported in Homer, consequently they are of remote antiquity.

Continuing, it is found that in Athens some 500-600 years B.C.

a special tax was usually levied to provide for the demosios iatros, communal physician. Their armamentarium consisted of herbs and drugs, poultices, fomentations, massages, baths and gymnasia. Also was included instruments for the performance of such surgical operations as trepanation.

The name of their hospital according to Lewinski-Corwin, was the iatreion. It was the community hospital as well as the city dispensary. Galen is quoted as saying, "these physicians were provided with large, light and airy buildings in the 5th century B.C. and the private physicians iatreion corresponded to a modern private sanatorium."

St. Basil as we will later see in the Early Christian era founded many of his Christian institutions on the Grecian xenodochion, which was an asylum for travelers.

"Cingalese records indicate the existence of hospitals in Ceylon in 437 and 137 B.C." (Garrison - Introduction to the History of Medicine.)

Approaching nearer to the life of Christ, we find the Asiatics were far from the barbaric in their treatment of the sick and feeble. The earliest record that we find of these hospitals are of those built by Gautma Buddha (400 B.C.). He appointed physicians, one for every ten villages, built asylums for the sick, the destitute, and for the cripples. His son, Upatisso built hospitals for the blind and for pregnant women.

In 300 B.C. Alexander the Great proclaimed "that wells and trees and caravanseries were to be erected in the public highways for the use of travelers; and that the sick and wounded were to be carefully attended to by the erection of medical houses or hospitals and depots

of medicine for the sick of man and animals.

They were provided "with instruments and medicines of all kinds made from mineral and vegetable or herb drugs. And skillful physicians were appointed to administer them at the expense of the state." (Ochsner and Sturm.)

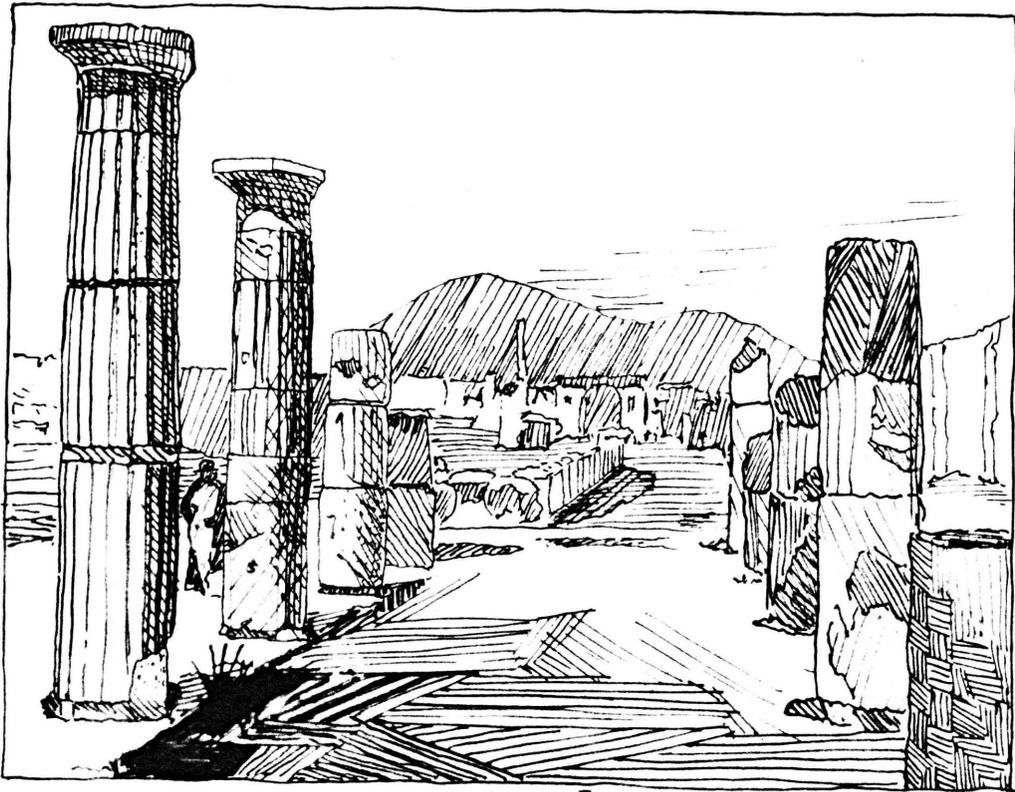
Turning temporarily to the western world Walsh writes "one of the earliest hospitals on record was founded by Princess Macha in Ireland (300 B.C.). It was called "Broin Bearg" (house of sorrow), and was used by the Red Branch Knights and served as the royal residence in Ulster until its destruction in A.D. 332."

"In 291 B.C., Aesculapius had a temple on the island in the Tiber where now stand the church and monastery of St. Bartholomew, in which the same rites were observed as among the Greeks." (Walsh.)

By Indian rock inscriptions 220 B.C. there is recorded the erection of hospitals by King Asoka. Ochsner and Sturm say, "There is direct proof that these hospitals were still in existence and flourishing in the seventh century A.D."

Julia Holmes Smith goes still further, when she says, "during the reign of Asoka the Buddhists cut the edict on hospitals in the solid rock, where it may be seen today. It directs the hospitals all along the routes of travel to be well provided "with instruments, medicines, mineral and vegetable drugs," and so tender was the regard for life that there was even an hospital for animals. Asoka also established four dispensaries at the gates of Patua."

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



Doak's History of Rome to 565 AD.

## POMPEII

The remains of an ancient Pre-Christian hospital  
were found in the city in the 19<sup>th</sup> Cen.

R.  
TAYLOR

One next turns to Rome at the height of its grandeur to trace the thread of pre-Christian hospitals. Lewinski-Corwin records "the large landowners in Rome established valetudinaria on their estates for the care of their sick slaves by the servi medici, to which members of the landlords' families would also resort."

In 219 B.C. Julia Holmes Smith says, "the first physician, who came from Greece to Rome, had a surgery (taberna) provided for him at public cost at the Acilian Crossway. He was called by the Romans, Vulnarius, "wound curer," but experience with his unskillfulness caused them to change his name to carnifex, "executioner."

In 1880 J. P. Dake, M.D. wrote a letter to the Medical Counselor, which letter was published by that magazine in the same year. As it is an authentic story of the remains of an hospital in Pompeii, I transcribe the main portion of it in these pages:

Dr. Dake wrote of this Pompeian hospital as follows: "I have just read with much interest, the initial communication in the Counselor for April on hospitals, and am reminded of a discovery I made, a few years ago while traveling in Italy, - discovery I say, because to me the fact was new, two thousand years ago, in the buried city there was a well-arranged and supplied hospital, not merely for the sick but for the injured also.

While looking through the great museum in the city of Naples, my attention was arrested by a collection of surgical instruments, comprising scalpels, scrapers, elevators, forceps, drills and a well-made vaginal speculum, with a card attached saying they were all taken from the ruins of Pompeii. I was surprised and delighted with such evidences

of arts neglected, if not entirely forgotten, during that long night of the Middle Ages.

Afterwards, while searching through the uncovered buildings and streets of that old city, I asked our guide if he could show me the place whence the instruments I had seen in Naples were taken. He promptly replied that he could and that they all came from one building. We had traversed many well worn streets and seen many objects of interest, when our guide, taking us through a good sized door-way into a large room said, " I will now show you the place where the instruments were found." The large room extended from the street back the full depth of the building, and on the right hand side, about midway from the front to the rear, was a hall running off at right angles, with a number of small rooms on either side. "In the first room, on the left of the hallway, were found the instruments, all in one spot."

• Surveying the premises it was quite evident to me that we were in a veritable hospital."

"No sign was there to tell if it had been a public or private hospital - if it had been reared by many-handed charity, having its cornerstone laid with pomp and ceremony - or if it had been only a private taberna, a surgical institute for pay patients alone."

The destruction of Pompeii in 79 A.D. by Vesuvius is definitely in the Christian era. Subsequent development of the hospital is consequently traced under the heading of that new era.

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



FROM A PHOTOGRAPH OF PAINTING BY HOFMAN, J.M.F.H.

40 CHRIST HEALING THE BLIND 41

HOSPITALS DURING THE FIFTEEN  
CENTURIES AFTER CHRIST.

With the life of Christ and his blessed example of purity, love and service, the hospital received its propelling force as an institution to relieve the sick and to care for the poor and feeble. Figuratively speaking, his example sent the hospital surging down through the ages with such force that for the 15 centuries following his life, Christianity was the only vital influence in hospital work. In fact it was even true up to the past century when science in general and medicine in particular finally came into their own and veritably revolutionized the institution of the past into the many wide and diversified fields of modern times.

Following immediately on the life of Christ, we find that, due to the persecution of the Christians, there were practically no hospitals built during the 1st and 2d centuries.

Nevertheless care for the ailing became a Christian tradition. A portion of the early church was set aside for medicinal purposes. The bishop in like manner took over the duties of physician as well as ecclesiast. The poor as well as the sick were cared for in these crude and humble beginnings. It is recorded that in 31 A.D. shelters were erected for the sick and the cripples around the pool Bethesda. They came to drink the water, which was said to possess miraculous healing powers.

St. Zoticus is reported to have built a hospital at Constantinople during the reign of Constantine (324-337). However, this report has been both confirmed and denied by competent authorities.

Wylie says, "In 325 A.D. hospitals were spoken of in the Council of Nice as institutions well known and deserving support and encouragement."

The exact date of the birth of St Jerome is unknown, but it is thought that he lived from 340 to 420 A.D. However, he is recorded as building curative hospitals at Bethelham. It is in his writings that the word "hospital" is first used in connection with curative establishments.

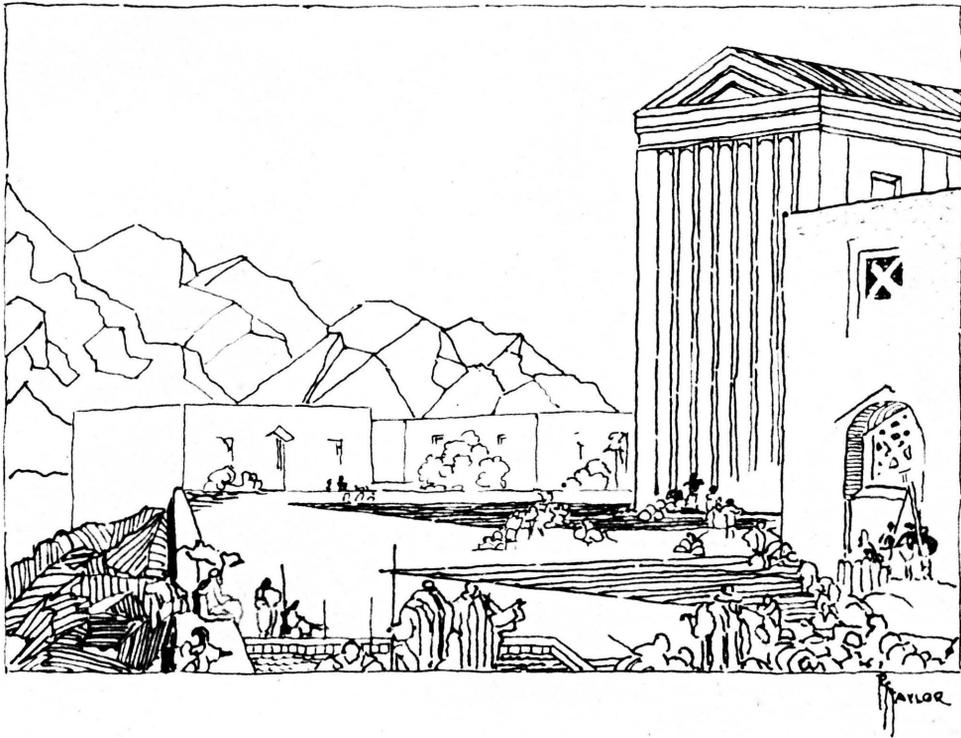
When Christianity freed the slaves many became vagrants and poor wretches. The result was an increased activity in hospital and asylum construction by the Christians to care for these starving people.

Julian, the Apostate, came to the throne in 361 A.D. That he built hospitals is evident from a letter which that emperor sent to Arsacius, high priest of Galacia, directing him to establish a xenodochium in each city to be supported out of the public revenues. As he plainly declares, his motive was to rival the philanthropic work of the Christians who cared for the pagans as well as their own." (Walsh)

St. Chrysostom (347 ? - 407) subsequently established several in Constantinople.

In 369 St. Basil (The Great) built a very famous hospital at the gates of Caesarea. "There were structures for different classes of the needy, - for children, for the old, and for strangers, as well as for the ill, besides buildings for physicians and nurses, workshops for what we have learned to call reconstruction work and industrial schools and an employment bureau." (Walsh)

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



HOSPITAL AT CAESAREA BUILT BY BISHOP BASILUS IN 369 AD.  
FROM A RESTORATION FROM "LIVING ARCHITECTURE"  
BY WOLTERS DORF.

St. Nazianzus was so impressed by this wonderful development, it is said that he described it as "an easy ascent to heaven."

The development was followed throughout the east by several other such religious men and in the west by such individuals as St. Ephraim who died in 381, and the rich Roman matrons, Fabiola, Marcella and Paula. These latter individuals, especially Fabiola gave large sums of money to the development of institutions for the care of the sick and poor.

It is quite evident that with the increase of Christian influence the hospital was only an outgrowth of such influence.

Such an example in the western world was the xenodochium at Porta, built by the Roman senator Pammachius.

Turning now to the fifth century, we find that the general tendency was towards the infirmaria of the monasteries. In the course of time these infirmaries developed into separate buildings, with special appropriations for their maintenance.

The Emperor Justinian (483-565) according to Lewinski-Corwin built open air hospitals arranged in a manner similar to those of the ancient Greek temples.

In the West from 498-514 Pope Symmachus built hospitals in connection with the churches of Saint Peter, St. Paul and St. Lawrence.

On the whole we are generally led to believe that the hospitals of these early centuries were dark, poorly lighted buildings with a very high death rate.

Early in the 6th century, St. Samson is reported to have built a hospital near the church of the St. Sophia and in the same report it was estimated that 35 such establishments were in the city of Constantinople alone.

Vigilius Belisarius founded a xenodochium during his

pontificate, 537-555, in the Via Lata at Rome. (Walsh)

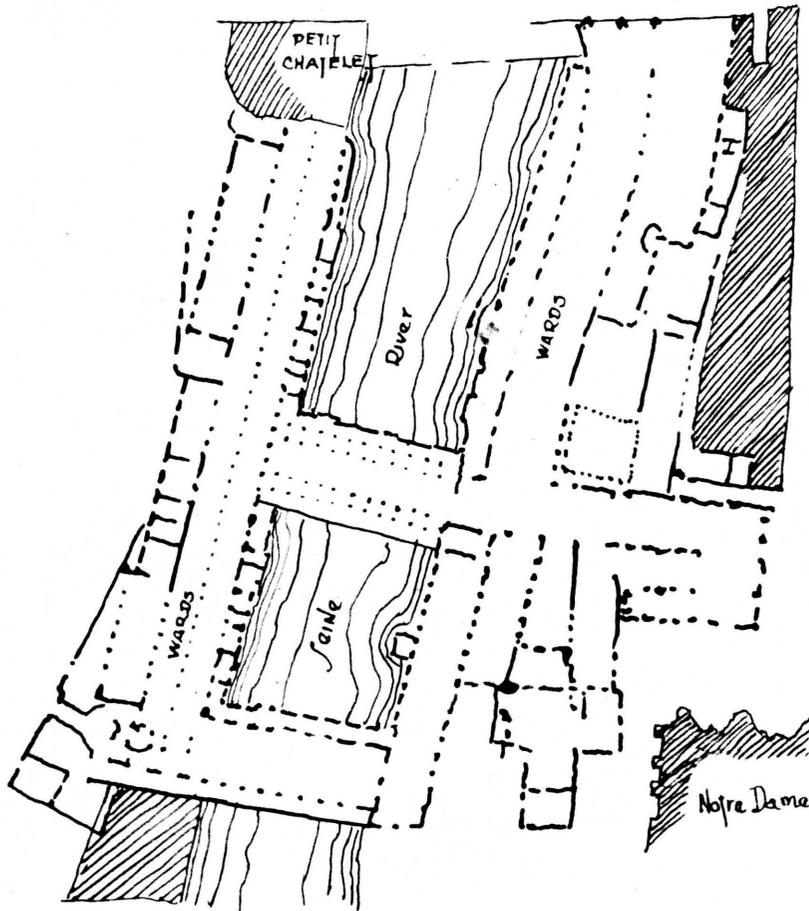
The first hospital in France was built by King Childebert and his spouse either in 542 or 549 A.D. The building, known as the Domus Dei was built at Lyons. Several were subsequently built throughout France.

The Christian attitude of the people is further reflected in the example set by Pelagious, who in the latter quarter of the sixth century converted his dwelling into a refuge for the poor and aged.

The spread of Christianity into Spain about this time is marked by the building of a hospital in 580 at Augusta Emerita (Merida) a town in the province of Badajoz by Bishop Masona. He endowed it heavily with funds and gave orders "wherever they found a sick man, slave or free, Christian or Jew, they should bring him in their arms to the hospital and provide him with bed and proper nourishment."

In the seventh century these hospitals in connection with churches continued their weary way, eternally searching for the means to enable man to regain his health. It is true that the progress of the institution under such circumstances must have been tragically slow and oftentimes discouraging, but even so, progress was made.

It was in such ignorance and darkness that the famous old hospital Hotel-Dieu of Paris was built. This hospital was built between 600 and 800 A.D. So permanent was this structure that the original section was not demolished until within the past fifty years. And as is to be expected many gross mistakes were made in every particular with this building throughout its history. Of this old structure more will be presented in subsequent history.



PLAN of HOTEL-DIEU PARIS BEFORE THE FIRE of 1772

• FROM WOLTERS DORF "LIVING ARCHITECTURE"

France

Stephen II (752-757) restored four ancient xenochio and added three others.

According to Lewinski-Corwin the heritage of Greek medicine was perpetuated and brought back to Europe by the Arabs, who established hospitals and medical schools at Bagdad, Damascus, Alexandria and other cities, and whose hospitals and schools of medicine at Cordova toward the close of the eighth century stimulated the revival of interest in Greek medical classics. It was not until the 13th century, however, that medical schools were founded as departments of universities. Continuing the report, it is found that although public dissection was occasionally practised, as at Bologna and Montpellier, the teaching was pre-eminently didactic, with little if any clinical instruction.

Up to 794 there is no evidence to prove the existence of hospitals in England, but it is a safe assumption to say that the monastic orders did the work prior to that date just as they did on the continent.

In 794 according to Harduin a large hospital was being built at St. Albans, England. A little later (796) Alcium writing to Eanbald II, Archbishop of York, exhorts him to have in mind the foundation of hospitals where the poor and the pilgrims may find admission and relief. The temporal rulers also were generous in this respect.

The advent and reign of Charlemagne (circa 800) brought a temporary flare in hospital development. He decreed that there should be a hospital in connection with every cathedral and monastery, and that those which had fallen into decay should be restored. However, the man was ahead of his times and after his death abuses set in which soon brought hospitals back to their former level.

Typical of these monastic hospitals is that of the monastery of

St. Gall, Switzerland which was planned about 820.

That this movement was taking place in Germany is proven by the fact that in 865 Archbishop of Hamburg founded a hospital in Bremen which he visited daily.

The earliest trace of the hospital orders or what really were orders for the purpose of ministering to the sick is found in the latter part of the 9th century. For it is reported that in 898 when Soror founded the hospital of Santa Maria della Scala at Siena the hospital orders were first organized.

These soon caught on and grew up all over Italy, France, Germany and Belgium.

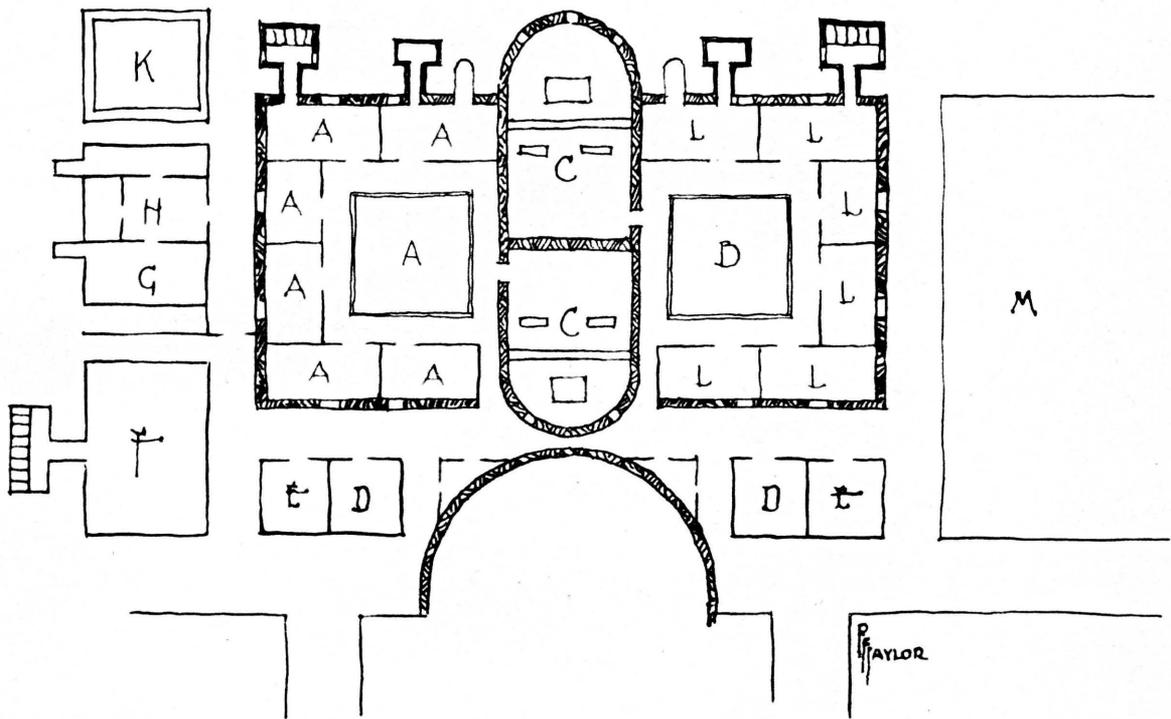
These orders it will soon be seen with the influx of the Crusades were soon followed by the military orders which in actuality were hospital orders fitted out for field work and military service.

In 910 the Benedictine Abbey of Cluny was built. It embodied the same monastic character seen in the religious infirmaries of the times. Besides its infirmary for the religious each monastery had a hospital in which externes were cared for.

The hospitals in Cologne by Heribert (1021) in Mildesheim by Godard (1038), in Constance by Conrad (973) are all examples of this same monastic, ecclesiastic influence.

In England we find some slight development in hospitals, namely the building of (932) St. Peter's, afterwards called St. Leonard's. King Athelstan it seems made secular grants to the secular canons of St. Peter's Cathedral, York, which they employed to found the hospital. The name of St. Leonard's came from the church which King Stephen later had built in the hospital. Later developments in this institution will be noted at a later date.

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



HOSPITAL QUARTERS : THE MONASTERY  
 of F. GALL SWITZERLAND

FROM WOLTERSDOFF  
 LIVING ARCHITECTURE

- |                             |                    |
|-----------------------------|--------------------|
| A - Hospital wards          | E - Bath rooms     |
| B - Monks Defectory         | F - Surgery        |
| C - Chapel                  | G - Doctor's rooms |
| D - Kitchen                 | H - Pharmacy       |
| K - Garden, medicinal herbs |                    |
| L - Monks school rooms      |                    |
| M - Cemetery                |                    |

In 1048 a school of medicine was established at Salerno in conjunction with which an order sprang up. This order called the "Brethren of the Hospital" was of the same character as those orders already mentioned in the 9th century.

Between 1081 and 1118 in Constantinople it is reported that Alexius I built there an orphanotrophium.

St. Gregory's hospital outside of Canterbury was built by Archbishop Lanfranc in 1084. Walsh describes it as "a large house, built of stone and divided into two sections, one for men and the other for women."

With the end of the 11th century came the first crusade into the Holy Land. These movements by the masses under such unusual conditions caused many epidemics of leprosy, small-pox, cholera and syphilis. The path of these epidemics extended from the Holy Land back to the then Western World.

Naturally to combat these plagues many hospitals were established on the routes to the Holy Land. The orders previously mentioned came into a strong and influential reality; of special note is the military order of St. John which was established during the first crusade and did wonderful work until the middle of the 14th century. It is apparent that due to wealth and laxity of morals most of these orders decayed about the same time. Today traces of them are seen in our modern day organizations, the Sisters of Mercy Sisters of Charity, etc.

Little if anything seems to be known about these hospitals of the Crusades. It is apparent, however, from the very temporary needs for which they were built that the hospitals must have been anything but progressive.

In 1123 St Bartholomew's was founded by Rahere near London. This old building along with St. Thomas's which appeared in the ensuing century, have approached in age a parallel of Hotel-Dieu in Paris; for in 1870 both of the English institutions were still considered among the most important hospitals in London.

Of interest is the fact that in 1130 the Lateran Council issued an anathema against monks and priests practising medicine, particularly surgery. Pope Innocent III during his pontificate re-issued the order about 1215. This move by the council and church must be viewed through the eyes of one living in those early days in order to see clearly the wisdom of the act. For in truth, the surgery performed by those priestly saints with all their good intentions was surely in those crude days of medicine anything but the most humane thing to have done.

The order of the Holy Ghost, one of the most important of the hospital orders was organized by Guy of Montpellier in that city in 1145.

The activity of these orders is again reflected in Ireland in 1174, for in that year Kilmainham Priory was built by the Knights of St. John. The example seems to have been followed elsewhere.

Walsh reflects, that in old Ireland the names of the towns such as Hospital, Spital, and Spiddal, etc., must portray a use in some former time implied by the name. He says 'the hospital was known as the forus tuaithe, i.e., the house of the territory, to indicate that it cared for the sick in a given district.'

Continuing, particular interest concerning old Ireland hospitals comes from old Brehon Laws which state that the hospital shall be free from debt, shall have 4 doors and there must be a stream of water running through the middle of the floor. "Dogs and fools and female scolds must be kept away from the patient lest he be worried."

Leper houses which later became general hospitals were quite common in Ireland about 1185.

The western world was not making all the attempts at progress; for in the same year, 1185, Isaac II came into his own and in the ten years which followed, he built the hospital of the Forty Martyrs in Constantinople.

Also in 1191 Clement III approved the Teutonic Order. It developed out of the field hospital under the walls of Acre, in which Count Adolph of Holstein with other German citizens ministered to the sick and wounded.

As the Crusades continued in their repeated treks to the Holy Land commerce was gradually stimulated to new heights. Ideas were advanced and as we have seen the need for hospitals was somewhat increased. Therefore towards the beginning of the 13th century hospitals came more into the public mind and rose to reality through the handiwork of the church, the powerful organ of the day.

This is evidenced many times during the beginning of the century throughout Europe. For in 1208 in Berlin St George Hospital was established. After this a hospital was considered requisite

for every city to afford shelter to the poor sick.

About this time Pope Innocent III was exerting his powerful influence towards the development of human welfare. We have already touched on one of his deeds. Of particular interest is the method he seems to have used to have created the extensive system throughout Christendom.

"The Pope," writes Walsh of Innocent III, "wishing to have a model hospital in Rome, sent for Guy de Montpellier (circa 1200), who, he was told had organized the greatest hospital of the time in that city. Guy was commissioned to establish a model hospital in Rome and planned the Santo Spiroto in the Borgo not far from the Vatican, which existed until our time. The Pope commended this hospital to bishops when they officially visited Rome, and recommended under conditions in which a recommendation was a virtual command, the establishment of similar institutions in their dioceses. As a result nearly every town of 5000 inhabitants or more in France, England, Italy, Spain and Germany came to have its public hospital in the course of the next 200 years." In that time 155 hospitals are reported to have been established in Germany alone.

In England St. Thomas's was constructed about 1215. It has ranked first along with St. Bartholomews as English hospitals ever since; the discussion of these has already been made.

Wylie quotes from Lamothe's book "Charitable Legislation," "in 1226 there were 2000 such institutions in France alone."

In 1260 St. Leonard's hospital was used partly as a foundling hospital "ministering to the poor and sick and to infants exposed there."

As the church increased in wealth and power in that day and age abuses frequently crept into the administrative functioning of the hospitals. To counteract these abuses we note such acts as that of the Council of Vienna which prohibited in 1311 the conferring of hospitals and their administration upon clerics as benefices.

In the 14th century city hospitals became more common. They were then very much as they are to day, merely hospitals for the objects of charity.

Continuing into the next century, we find that one of the earliest accounts of physicians or surgeons being connected with a hospital was among the Templars under John de Lastic, who in 1437 defined the duty of the physicians and surgeons.

In 1456 The Grand Hospital of Milan was opened. So typical was this example of the times that a detailed description of the building seems quite fitting here. In 1875 Wylie wrote of the building as follows: "The Grand Hospital of Milan opened in 1456, is still in use as a hospital, and contains usually more than 2000 patients. The buildings stand around square yards, the principal one being much larger than the others, and separating the hospital into two parts. The main wards on either side of this large court form a cross, in the centre of which is a cupola, with an altar beneath it where divine service is performed daily in sight of the patients. These wards have corridors on both sides, which are not so lofty as the ceilings of the wards, and consequently there is plenty of room for windows above these passages. The ceilings are thirty or forty feet high and the floors covered with red bricks or flags. The outside wards are nothing but spacious corridors. These wards were first warmed by open charcoal-braziers."

"This hospital, built at the time when the church of Rome was at

the height of its power, and but a short time before the Reformation, is a good example of what had been attained toward the development of hospitals, and it shows how much a part of the church the institution of hospitals was."

We find in speaking generally of the medieval hospitals:

- (1) They were constantly seeking to improve.
- (2) They occupied a location near water, preferably a running stream.
- (3) They were often outside the city walls for obvious reasons.
- (4) They were within easy reach of the poorer classes.
- (5) They were often no more than large houses taking care of 7, 15 or perhaps 25.
- (6) They were of necessity in the larger establishments characterized by large spacious wards with big windows. Such as the wards of

Santo Spiroto, Rome	409' x 40'
The hospital at Tonnerre	260' x 60'
" " " Angers	195' x 72'
" " " Ghent	180' x 52'
" " " Frankfort	130' x 40'
" " " Chartres	117' x 42'

- (7) They were handsomely decorated in many cases as were the cathedrals.

Notable in this respect is the hospital at Sienna.

- (8) They always had a costly chapel which was the center of action.

Julia Smith says the wards clustered around the chapel, more costly and elegant than any other part of the building.

(9) They were universally built on the "block plan" or the compact several storied type building. In that day of ignorance it was an abominable condition as the one fact alone bred disease and death.

(10) They had all beds in large wards only separated - if and when they were separated - by a small movable partition.

The conditions and characteristics listed above were generally true of the hospitals of all the countries influenced by Christianity prior to the Reformation.

Truly it might be said that Hospitalization reached magnificent heights in the 14th and early 15th centuries; considering of course that the light of day of the medical and scientific world had not then broken upon mankind.

With the Reformation came vast religious upheavals. Naturally hospitals were vitally affected.

## POST REFORMATION HOSPITALS

### The Dark Era in Their History

Although many abuses crept into the administration of the monasteries and hospitals just prior to the reformation, the standards of hospitalization had been generally very high. The architecture reflected a friendly, open, and charitable atmosphere that had for so long been foremost in the Christian mind. The church had been the guiding light in all such work.

Therefore when the Reformation came with such acts as that of Henry VIII, who confiscated monasteries, libraries, hospitals, etc., the general decline of the hospitals was ensured.

"Even Luther confessed more than once that under the papacy generous provision had been made for all classes of suffering, while among his own followers no one contributed to the maintenance of the sick and poor. As a result the hospitals in Protestant countries were secularized, though efforts were not wanting, on the part of parish and municipality to provide funds for charitable purposes." (Walsh)

About this time J. L. Vives, humanist, declared that by Divine Ordinance each must eat his bread after earning it by the sweat of his brow, that the magistrates should ascertain by census who among the citizens were able to work and who were really helpless. He urged strict economy in the administration of hospitals, better provision for medical attendance and a fairer apportionment of available funds whereby the surplus of the wealthier institutions should be assigned to the poorer.

Apparently this plan was first put into effect at Ypres in

Belgium and then extended by Charles V to his entire empire in 1531.

Hospitalization in connection with war was more strongly influenced about the beginning of the 16th century. It was in connection with such military hospitals that Ambrose Pare later in the same century performed his unusual deeds as a military surgeon.

Walsh attributes many of the abuses that crept into the administration of hospitals to the fact that women were largely replaced by men. Certainly today it must be said good hospitals, good nursing and good surgery are inseparable to the success of each.

Hotel-Dieu at Paris which had hitherto been well-managed is reported to have begun to suffer from serious abuses. A board of eight was appointed in 1505 to govern this establishment. However, the good they might have accomplished was covered by the tragic reports which later came from that institution.

That the ideals of Christianity had not been forced out entirely is evidenced by the fact that in 1530 Jolncle Dios, a Portugese of the order of the "Brother Hospitallers," converted his home, a deserted shed, into a hospital; and in time he came into possession of a large building, where he and many other pious men cared for the sick and unfortunate."

In 1531, the Council of Trent renewed the decrees of Vienna and furthermore ordained that every person charged with the administration of a hospital should be held to a strict account and in case of inefficiency or irregularity in the use of funds, should not only be subject to ecclesiastical censure but should also be removed from office and

obliged to make restitution. The most important of the decrees placed the hospital under episcopal control, proclaiming a bishop should regularly visit and inspect the hospital.

The hospital of Milan was subsequently built under the more stringent regulations. Undeserving patients were consequently refused admission.

Arthur Leach further proves the existence of these abuses when he says: "The Valor Ecclesiasticus of 1535 revealed the extent to which the hospitals were mismanaged. In one after another there were only one or two poor, and the master took nearly the whole of the revenues to his own uses, and where none he took the whole."

In 1575 at the siege of Metz, through the influence of Ambrose Pare, of whom we have already spoken, one was built.

In 1581 on the same island in the Tiber where the aesculapium of pagan Rome had stood a new hospital was built. Also, Lorenzo in Fonte was erected in 1624 by a charitable layman, Giovanni Vestri. It was for persons in the service of the popes for fourteen years, such as cardinals and bishops.

Jacobson, in his "Essays of the History and Care for the Ailing" has been quoted as follows: "It is worthy of remark that attention to the well-being of the sick and improvements in hospitals and institutions generally, had a period of complete and lasting stagnation from the close of the Thirty Years War." (1648). He adds: "The hospitals of cities were like prisons, with bare, undecorated walls and little dark rooms, small windows where no sun could enter, and dismal wards where 50 or 100 patients were crowded together, deprived of all comforts and even of necessaries. In the municipal and state institutions of this period the beautiful

gardens, roomy halls and springs of water of the old cloister hospital of the Middle Ages were not heard of, still less the comforts of their friendly interiors."

In France under Louis XIV hospitals were under the sovereign. Besides the Hotel des Invalides, which he began in 1670, he erected in Paris an establishment for every need. However, Louis' work in this field has been criticized as "a monument and proof of the profusion and pride of that sovereign, rather than an expression of care for meritorious soldiers."

St. Vincent de Paul about the close of the 17th century did wondrous deeds among the sick; in France most important of these was the founding of a community to care for the poor sick.

An increase in teaching and scientific research is reflected in the medical school of Leyden which through the writings and teachings of Boerhaave we are told 'became early in the 18th century, the most famous of that period and held the position of the first medical school of Europe for a generation.'

Important is the above in that it veritably heralded the dawn of the scientific day which still lay more than a century and a half away.

In England from 1710-1797, apparently many hospitals were built. Prior to that time the number of these establishments was small indeed - Britannica says in this respect, "it was not until the commencement of the 18th century that towns of from 50,000 to 100,000 inhabitants began to provide themselves with hospitals for the care of the sick.

Thus, 23 of the principal English counties appear to have had no general hospital prior to 1710, while London itself at that date was mainly, if not entirely, dependent upon St. Bartholomews and St. Thomas's Hospitals."

The day of invention is evidenced in 1713 in Cardinal de Polignac's "Le Mekanique a Feu." He in particular treats of ventilation and gives detailed plans for the construction of fireplaces. To him is due the credit of inventing the first machine for forcing ventilation. Polignac realized that it was not the warmth of a room, but its inequality of temperature and want of ventilation that is the origin of numerous maladies. The cardinal's method was to heat the air in chambers behind the fireplaces and from there to conduct it to the rooms. Thus warm fresh air was first continually circulated.

In 1715 Desaguliers, a French refugee then residing in London translated the work of Cardinal de Polignac into English. He in turn did some equally marvelous work of his own in this respect. Among the first of which was the ventilation of the House of Commons, London. The results affected hospitals considerably in later years.

San Gallicano erected by Benedict XIII in 1726 was built for the cure of skin diseases.

With the building of the Royal Infirmary of Edinburgh in 1734 a big step in progress is noted in the close affiliation of the medical school of the University and the hospital. Wylie in 1875, said, "The original building is still standing; it consists of a central administrative portion with wings two stories high on either side, containing the wards; the whole hospital is one solid building, but the windows are large and opposite, and the number of beds in each ward is small compared with the old

church hospitals. In many respects it shows progress, but it is evident that the controlling ideas in the plan of construction were economy and convenience of administration."

Speaking of hospitals and typhus fever, in 1752, Sir John Pringle, a student of Boerhaave, recommended barns and other open buildings in preference to closed houses, and says that pure air is of more importance than warmth. He recommended open fires as the best method of heating and says soldiers may be treated under sheds. It is from such ideas that the pavilion hospital arose. Briefly, the pavilion hospital is that type of institution which comprises many small buildings covering large ground areas. It is the direct opposite to the block plan, many storied hospital, which utilizes small ground areas and has a comparative low unit cost of construction and administration.

One of the earliest of the Pavilion Hospitals, the hospital at stone house near Plymouth, England, was begun in 1756 and finished in 1764, It was used for sick seamen. The wards, which were in separate pavilions, had 20 beds each. This hospital designed by Roverhead of London served as a model for a French Committee almost 30 years later. This pavilion plan was not adopted in England for more than one hundred years however. It is unfortunate indeed, as the pavilion system offered the people of that day in their scientific ignorance more light, fresh air and segregation of the sick than did the block plan. Although these facts may not have been apparent to many, it must unquestionably have been economy of construction that prevented the building of hospitals under the more healthy conditions of the day.

Scientific research was increasing in momentum about the same time and such is evidenced by the works of Van Swieten published in 1760 and those of Donald Murro and Richard Brocklesly in 1764.

In 1772 our attention is again directed to Hotel-Dieu when in that year part of it burned. Three years later Dr. John Jones, a man who had studied in St. Thomas's and St. Bartholomews in London and Hotel-Dieu in Paris wrote of the latter in his book on hospital construction as follows: "The Hotel-Dieu, a vast building situated in the middle of that great city, receives about 22000 patients annually, 1/5 of which number die. "

"It is impossible," he continues, "for a man of any humanity to walk through the long wards of this crowded hospital, without a mixture of horror and commiseration at the sad spectacle of misery which presents itself. The beds are placed in triple rows, with 4 and 6 patients in a bed; and I have more than once, in the morning rounds, found the dead lying with the living; for, notwithstanding the great assiduity and tenderness of the nurses, some of whom are women of family and take the veil and piously devote themselves to that office, yet it is almost impossible from the vast number of patients, to bestow timely assistance upon every individual." (Wylie)

In England in St. Bartholomew's and St. Thomas's the death rate was at that time one in thirteen or about 600 annually.

To correct some of the shocking conditions in Paris a committee from the French Academy of Science in 1786 was appointed to study and plan out the proper plan upon which to rebuild Hotel-Dieu. These men made a very detailed study of hospitals, going even to England and studying the plan of the pavilion hospital at Stonehouse. So strongly were these men impressed with the English example that they published the following recommendations about 1788:

- (1) There should be detached pavilions arranged in parallel lines.
- (2) The buildings for offices, kitchens, pharmacy and other administrative purposes should be in front.

- (3) Pavilions on one side should be for men and on the other for women.
- (4) The chapel and operating room should be in the rear of the plot.
- (5) Pavilions should be 3 stories high.
- (6) Pavilions should be 24' - 0" x 168' - 0".
- (7) The ends of the building for 30' - 0" being wider, and containing service rooms for the wards.
- (8) Wards to be 108' - 0" long x 14' - 0" or 15' - 0" high.
- (9) Each ward should have from 34 to 36 beds arranged in two rows.
- (10) Each ward should have its own English water-closets, lavatory, kitchen for special diet, and sisters or nurses' room with everything at hand for the care and comfort of patients.
- (11) Each ward should be well separated by plenty of air space.
- (12) There should be no contiguous, communicating wards as they are in reality merely one ward having a common atmosphere.

The old Hotel-Dieu was to have been rebuilt in four parts, each part to be built on the 4 cardinal points of the city. These recommendations even got as near reality as a government decree which was soon subsequently published.

But tragic to relate these recommendations and decrees were of no avail when France became convulsed with her revolutions.

In England about this time John Howard, a philanthropist seems to have made efforts to follow the above mentioned recommendations. However, the results of his efforts are lacking and little practical value can be attached to his work.

Pinel, the great French psychiatrist, who struck the manacles from the insane of France (circa 1795) declared Spain to be the country in which lunatics were treated with most wisdom and most humanity.

Of the character of the surgery performed in medieval days and the subsequent centuries, Walsh gives a most interesting description: "strange as it may seem, for several centuries at this time, serious operations were performed under an anaesthetic and surgeons boasted of getting union by first intention. They used linen soaked in strong wine as primary dressings for their wounds and this acted as an antiseptic. These medieval surgeons

declared that it was not necessary to have pus in wounds, but that on the contrary the presence of pus was an index of negligence of the surgeon. Unfortunately, the teaching went out to be followed for some five centuries by the doctrine of laudable pus. As a result hospitals became surgically unclean, and infections multiplied to such and extent that surgeons feared to operate."

In France in 1803 the state assumed control of hospitals. Recommendations as to reform in classification, cleanliness, nursing and change in the administration in general were made.

From 1800-1850, however, the hospitals in both France and England continued to be built on the block plan rather than the more healthy and expensive pavilion plan. Germany and Russia apparently were even in the rear of this slow development, having made prior to the 19th century very little progress at all in hospital work.

In conclusion, this period of hospital history produced nothing of very vital importance to the progress of the health of man with a few possible exceptions. Namely, the innovation of the pavilion system and the beginning of scientific, medical, and mechanical discoveries. Men died like flies, all too many of whom from overcrowding and careless neglect.

With the Crimean War in the middle of the last century came the era in which the hospital we know today was born.

## THE AMERICAN HOSPITAL PRIOR TO THE CIVIL WAR

We would naturally presume that hospitalization in America takes its origin directly from the Europeans, whose similar work was so steeped in tradition, history, etc. However, such seems not to be the case. For in Wylies transcription of an extract of Prescott's "Conquest of Mexico" we find evidence to the contrary. Prescott writes, "I must not omit to notice here an institution the introduction of which in the Old World, is ranked among the beneficent fruits of Christianity. Hospitals were established in the principal cities, for the cure of the sick, and permanent refuge for the disabled soldiers; and surgeons were placed over them 'who were so far better than those in Europe,' says an old chronicler, 'that they did not protract the cure, in order to increase the pay.' " In speaking of Montezuma, 'He showed a similar munificent spirit in his public works, constructing and embellishing the temples, bringing water into the capitol by new channels, and establishing a hospital, or retreat for invalid soldiers, in the city of Colhuacan!"

Religion could not have prompted their building of hospitals for every year one in a thousand of their population was sacrificed and eaten.

The first hospital of America influenced by Christian tradition was built by Cortes in the City of Mexico in 1524. He built it in gratitude to the Lord for the safe journey to this country afforded him. Originally it was called Hospital de la Purisima Concepcion, which was later changed to Hospital de la Jesus Nazareno. Hospital San Larazo founded in the next decade was built to accommodate 400 patients.

Also in the city of Mexico in 1540 the Royal Hospital was supposedly built. One year later; law ordered hospitals built in all Spanish and Indian towns.

About this time it is reported the 12th part of the priests income was required to go to the support of hospitals.

A congregation, in 1585, established by Bernardin Alvarez, a citizen of Mexico and approved by Clement VIII in 1594, devoted themselves to the care of the sick.

Hospitals next appear in Canada in 1639. In that year the Duchess of Aiguillon is reported to have founded one at Sillery, which was later transferred to Quebec. It was at the beginning of this century still in existence and was administered by the Hospitalieres de la Misericorde de Jesus.

Five years later Hotel-Dieu at Montreal was founded by Jeanne Mance.

The first record of a hospitalization within continental United States is that of a hospital on Manhattan Island in 1658. Apparently it was built at the request of Surgeon Hendricksen Varrevanger, for the reception of sick soldiers who had been previously billeted on private families, and for the West India Company's negroes. In 1679 this hospital consisted of five houses.

The U. S. Public health service next records the erection of a hospital in 1663 on Manhattan Island, N. Y. "This was a primitive institution under the direction of a Dutch matron, which existed near Whitehall Street, New York City, for only a few years and was abandoned in 1674."

Returning to Mexico, briefly, there is record that in 1663

Pedro de Batancourt founded the Bethlehems and that in 1673 Clement X approved the order. This order apparently "spread from Guatemala over nearly the whole of Latin America and rendered excellent service by their hospital work until their suppression, as well as all other religious institutions in Mexico in 1820."

The General Hospital of Quebec was built in 1693.

Early in the 18th century pest houses were established in Salem, Mass, in New York, and Charleston, and in 1717 in Boston there was built a hospital for contagious diseases.

In 1720 Jean Louis, previously a sailor who had become an officer in the company of the Indies, is reported to have left 12000 livres with which the Charity hospital in New Orleans was subsequently built. It is reported to have been destroyed in 1779 by a hurricane.

The United States Public Health service in answer to a query about hospitals of this era writes as follows:

"The oldest existing hospital in New York City is the Bellevue Hospital, 24th street and 1st Avenue. It was founded in 1735, and the first building completed in 1736. This hospital and the Philadelphia General Hospital claim jointly the honor of being the oldest existing hospitals in the United States."

"The Philadelphia General Hospital, 34th and Pine Sts, Philadelphia, Pa., was opened in 1732 as the Philadelphia Almshouse, 3rd, 4th, Spruce and Pine Streets. This brick building claims the distinction of being the first large building building in the United States to be used as a hospital in the modern sense."

The present site was purchased January 1, 1829 and the first admission of a patient occurred August 22, 1833. The present buildings were begun on September 21, 1925 and completed and opened in 1931."

"Another hospital which claims to be the first founded is the Pennsylvania Hospital, 8th and Spruce Streets, Philadelphia, Pa., founded and incorporated in 1751 by act of the Provincial Assembly as a result of the efforts of Dr. Thomas Bond and Benjamin Franklin."

In 1755 The Pennsylvania Hospital, according to Wylie, was started but the original plan was not completed until 1805. The hospital built on the original plan was still in use in 1875. It consisted of a central administrative part, with two wings of wards two stories, with a basement. That it was an improvement over the cloister, monastery type hospital there can be little doubt.

In 1770 the New York Hospital was founded. Five years later when hardly finished it was completely destroyed by fire not to be rebuilt until 1791.

Also some interesting facts are presented in connection with hospitals and our Revolutionary War. "In the very beginning of the revolutionary war great solicitude was shown for the proper care of the sick and wounded soldiers. After the battle of Breeds (or Bunker) Hill, a hospital was established at Cambridge in several private but commodious houses, and Dr. John Warren, a brother and pupil of Dr. Joseph Warren, who fell while commanding the troops in that battle, was placed in charge, and soon after this several hospitals were established around Boston." (Wylie)

General Washington pled for organization of the hospital department in a letter to the President of Congress. Poverty prevented such action, hence many small houses were used for the purpose.

In 1780 the New Charity Hospital (San Carlos) was founded. In 1911 it was changed to the city municipal Hospital and having in subsequent years risen to such size as to accommodate 8000 patients annually.

Hospitalization in the sixty years prior to the Civil War was morbid in its entirety. It is quite evident that due to the high death rate the institution was shunned by the average American. Surgery was so unsafe that pyemia often caused death from the slightest amputation or minor cut.

Continuing, Waltersdorf writes of the hospitals of the period in a very conclusive manner: "In view of the primitiveness of the hospitals of the first half of the nineteenth century, it is not difficult to understand why hospitals were shunned. Our parents remembered the bleak white walls, wards of excessive capacities, limited sanitary equipment, noises, odors, and sights of the old institutions, where hardly anything was concealed or noises restrained."

Such were the conditions prior to the Civil War in this country.



• FLORENCE NIGHTINGALE •  
• FROM A PHOTOGRAPH •

THE PAVILION HOSPITAL  
1850-1880

The Crimean War and the Civil War literally brought out the crying needs for hospitals in Europe and the United States. In England the horrible conditions were especially emphasized by Florence Nightingale. First of all her own wonderful example in the Crimean War and secondly her published notes on the hospitals and on nursing did wonders towards opening the eyes of her country and the world.

The recommendations of the French Academy which had lain dormant for almost a century were then seized by all thinkers of the times and with only minor modifications were generally adapted in the better institutions.

The earliest example of such action is reflected in the building of the Lariboisiere Hospital in Paris in 1854. Strongly did that building resemble the old pavilion hospital at Stonehouse which previously had been so lauded by the French Committee.

Naturally enough all hospitals which were subsequently built did not follow the recommendations of the committee and were not constructed altogether on the pavilion plan; for it must be remembered that the features embodied in the pavilion type were perhaps 40% more expensive in their initial cost neglecting even the equally higher cost of administration. As a result many hospitals especially in this country followed the block plan many storied type.

In 1855, the call from Florence Nightingale being followed, the English Government appointed a sanitary commission to proceed at once to the Crimea.

Many reforms followed. In France in 1854 the sanitary inspector of the Army had recommended the use of wooden barracks or huts for hospitals and also proposed a permanent tent hospital.

The reason for such temporary structures is quite evident when we review the writings of Julia Smith written about 1880. She writes as follows: "This style (block plan) of hospital prevails even today in many cities of Europe and America, except that in the place of the chapel we have the closed court."

"This very permanency of structure is objectionable, because all building materials absorb more or less of miasm, and it is a fact that after buildings have been in use a few years, it is risking much to perform dangerous operations in the wards."

St. Vincent's Hospital originally erected in 1849 (New York) was changed to its permanent site in 1856-60. It was in the latter years built to house 140 patients. In recent years that number had increased to 5000 annually.

In 1855-56 the Hospital Renkioi on the Dardanelles was founded. Built strictly on the pavilion system, it embodied the healthiest conditions of the day. Since, it has housed 2250 beds under its many roofs.

The first fruits that England reaped from the efforts of Florence Nightingale in hospitalization occurred in the building of Blackburn Infirmary near Manchester in 1859 and Herbert Hospital near Woolwich in 1859-64.

Both are strictly pavilion hospitals. The latter was carefully planned as regards sunlight and natural ventilation. The

choice of location outside the city, upon an elevation was most admirable. About 1877 it served as a model throughout the United Kingdom.

That the United States progressed at the same pace is evident by the building of the Episcopal Hospital in Philadelphia in 1860. It like the above was built on the pavilion type.

Early in the Civil War a sanitary commission was organized.

In July of 1861 it recommended the following:

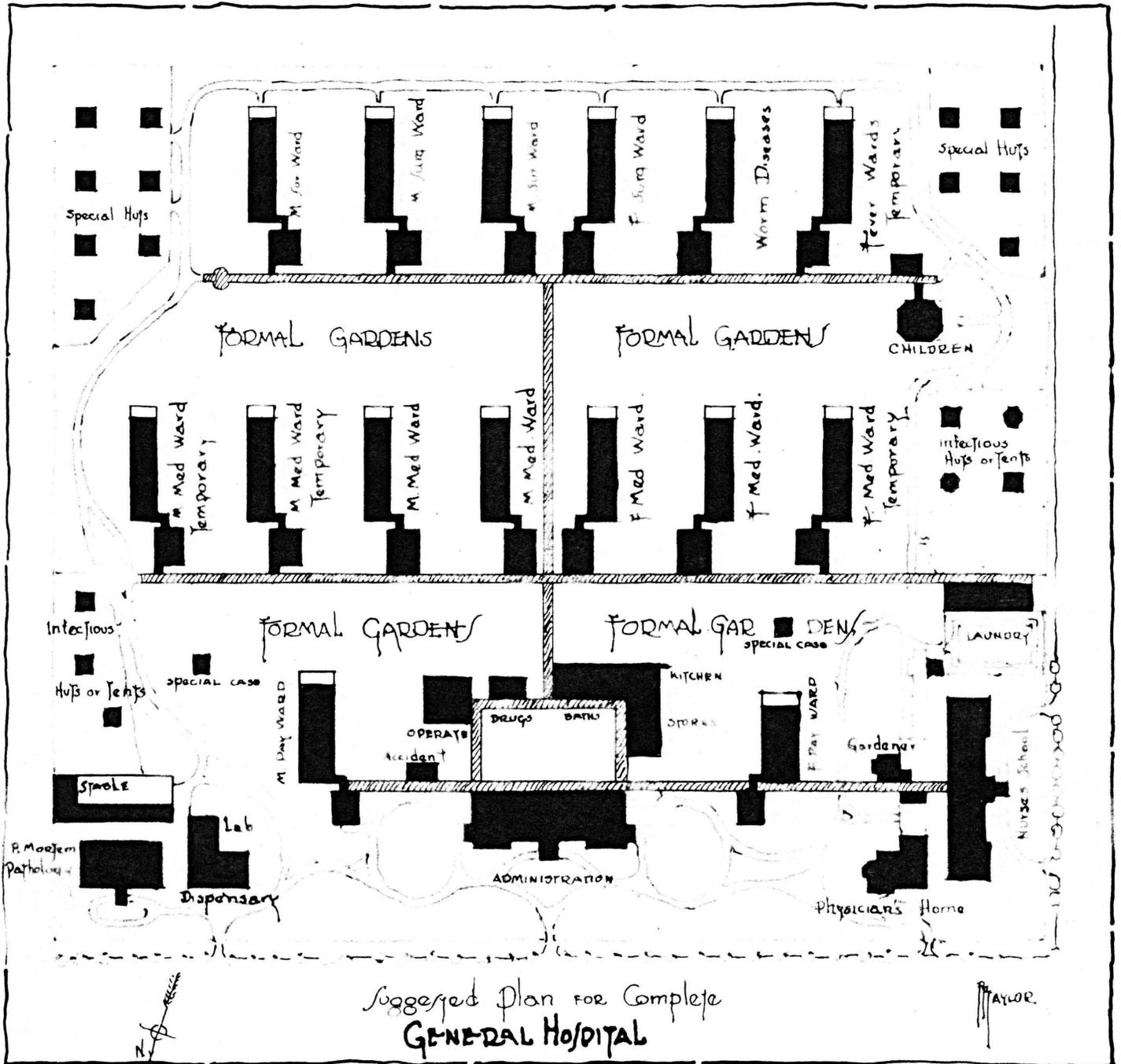
- (1) The use of old buildings for general hospitals should be abolished.
- (2) Wooden shanties or pavilion should be erected.
- (3) Each should be fully provided with water for bathing, washing and water closets.
- (4) Ample arrangements for ventilation and for securing warmth in winter should be made.
- (5) Each pavilion should accommodate from 30 to 60 each and should be sufficiently separated so that there would be no danger of diseases carrying across.

The Government on the strength of these recommendations planned two such cheap model hospitals at Washington. That the system which fol- throughout the War was extremely successful, is evidenced by the follow- ing statistics from Wylie. "The success was such that an army (Union) Averaging 744,346 men passed through a four years' war with an annual death-rate of only eighty-eight per thousand from all causes. It is estimated that thirty-three out of the eighty-eight were violent deaths leaving fifty-five from disease in one thousand. The Confederates used the same system with equal success.

From the Civil War came three general conclusions:

- (1) The hospital should be placed on a large area of ground, so that the pavilions could be widely separated from the administrative buildings and from one another.
- (2) The wards should be only one story in height and should be ventilated by openings along the ridge of the roof.

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



THE PAVILION HOSPITAL of 1870 ~  
- FROM W.G. Wylie ~

(3) The ward-pavilion should not be put up to remain for generations to come, but only so long as they were free from infection; and that when once they were infected, they should be destroyed and replaced with entirely new structures.

The new St. Thomas's Hospital built on the banks of the River Thames, opposite the House of Parliament represented the best known hospital ever built upon the several storied pavilion plan. Its architectural beauty was unsurpassed and considering the time in which it was built may still be looked upon as practically perfect.

In 1867 a complete civil hospital on the pavilion plan was built at Leipsic, Germany, that was reported in 1875 to have, at that time, been highly successful. Similarly the General City Hospital at Friedrichshain, Berlin, 1868-74 was built. Ochsner and Sturm in writing of the latter hospital say: "The hospital was built just before the antiseptic period. At that time there existed a general feeling among scientific medical men that a definite substance passed from one patient to another, causing the second patient to become afflicted with the same disease as the first; an affection that would attack patients successively in one building, but would not affect those in a separate building." Consequently as we have seen before isolation was installed in both of the German hospitals on the pavilion plan.

Wylie in 1870 was a resident physician on the hospital staff of Bellevue Hospital, N. Y. He writes of his experiences there: "The sanitary conditions of the hospital were shocking, notwithstanding the fact that to the visitor the wards presented a clean and orderly appearance. I saw, while on duty in the wards, patients die from septic diseases contracted in the wards after the slightest surgical operations

or injuries. From 40 to 60 percent of all amputations proved fatal; and I saw a strong healthy man die from pyemia following an amputation of a great toe."

The hospital of 1870 was built at a unit cost of 15¢ per cubic foot. "The exterior was simple; the plumbing and heating were of a kind now considered rudimentary; the building was not fireproof, and was finished with wood and with plaster on lath.

That all hospitals were not built on the pavilion plan during this period is evidenced by the block plan, many storied addition which was made to the New York Hospital about 1875. First under all there was a sub-cellar. Moving upwards, we find the basement, which was on a level with the street, contained the dispensary. The first floor contained the administrative offices and a few private wards. Next above, the second, the third and fourth floors were devoted entirely to common wards. On the fifth floor, one ward and the operating theatre were placed. The kitchen and drying room were located on the sixth floor with the laundry on the seventh, capping off the entire structure.

The structure was severely criticized at the time by many of the leading surgeons and physicians.

In Boston, the one story pavilion plan with ridge-ventilation was adopted as was the case in most parts of the United States. Generally those hospitals which were built on the block plan, many storied type had pavilions built close by in which were placed their contagious diseases.

Probably the most famous of the pavilion type hospitals was the Johns-Hopkins Hospital built in Baltimore in 1875.

So outstanding was its design that for many years thereafter its design was looked upon as a criterion of perfection. Further, it is evident that its design was never approached in perfection by any other pavilion hospital thereafter. The reasons remaining will be presented in the next chapter.



FAYLOR

· JOSEPH LISTER ·  
From Godlee's book "LORD LISTER"

## THE RISE OF THE MODERN HOSPITAL

We might say beginning with Pasteur's first real contribution to science in 1848 the long awaited dawn of the scientific day at last broke upon man. To mention only the discoveries which thereafter followed would require volumes. However, hospital development although vastly affected by these discoveries owes most of its present character and advancement to the works of Joseph Lister (1827-1912). Tanner writes of him as follows: "Lister is another of those pioneers who lived and worked during what may be called the golden age of bacteriology. Unlike Pasteur, he was trained in medicine. In order to appreciate fully the significance of Lister's work one must know something of surgery in pre-Listerian times. When he was an interne in the University College Hospital he had opportunity to observe at first hand the infections which followed surgery, childbirth, etc. The surgery of the day was in a pitiable condition. Hospitals of that time (1860) were seething beds of infection. The mortality was terrific and every precaution was taken to check it, to no avail. These attempts had to do mainly with improvements in hospital construction, ventilation, etc. After careful study, Lister was convinced that inflammations and the accompanying suppuration were caused by certain bacteria. If they could be eliminated, these terrible conditions would be prevented." Lister's efforts were rewarded in 1867 in the birth of aseptic surgery. For his purpose he employed phenol (carbolic acid) to perform clean surgery.

Thus it was with this vast step in surgery made towards the control of germs that the modern hospital gained its foothold in the modern world.

In this same era of invention and scientific discovery the industrial world improved with the same strides witnessed in medicine.

One of the first among these industrial developments that affected hospitals was the invention of the electric light. For on Oct. 21, 1879, after expending more than \$40,000 in fruitless experiments, Thomas Alva Edison succeeded in making an incandescent lamp in which a loop of carbonized cotton thread glowed in a vacuum for over 40 hours.

With the eighties came the innovation of structural steel in the building industry. In 1883, W.L.B. Jenney, in the design of The Home Insurance Building, Chicago, "actually carried out what no one ever had done in theory or practice before - took the dead load off his walls and placed it on a skeleton framework of iron concealed inside the masonry." (Starrett)

Coming closer to our own century we find another all important step made in medical and scientific advancement in 1895. In that year W.R. Rontgen of Munich discovered a new kind of radiation now known as X-rays or Rontgen rays. Since that day, only a few years back, the X-ray has proved indispensable to modern medicine and the health of man.

The hospital with so many vast improvements having been made, took on a new atmosphere with the incoming twentieth century. The public was educated to their value by that time and had forgotten the horrible conditions of former years.

Under such improved conditions the institution thrived. Types of hospitals for special types of disease became common. A few examples of such are: the general hospital located usually in the city; the municipal city charity hospital built for the care of charity patients; and the numerous specialized institutions either private or government supported such as those for patients suffering from

# HOSPITALS - THEIR HISTORY & DEVELOPMENT

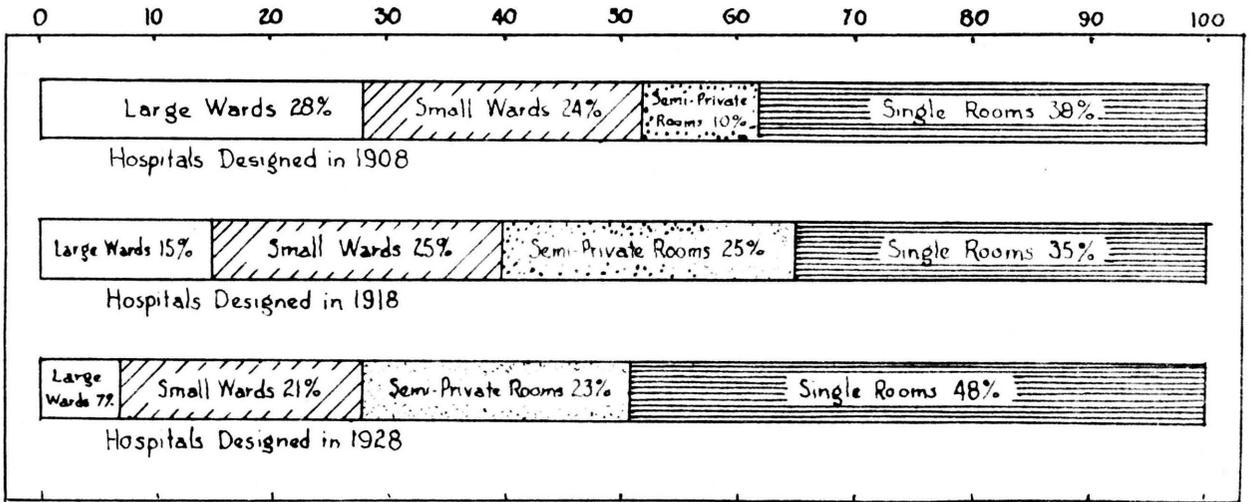
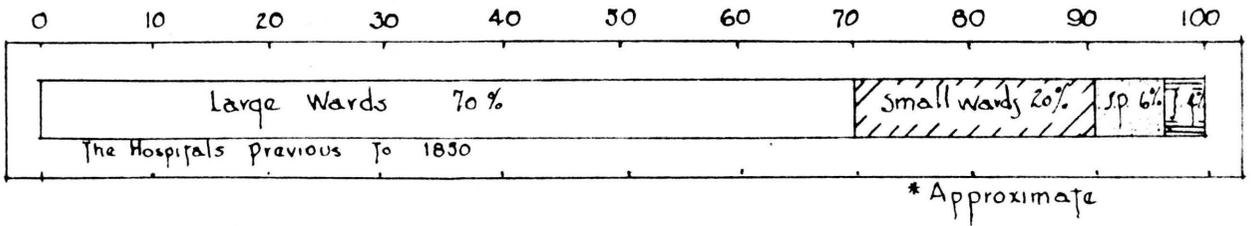
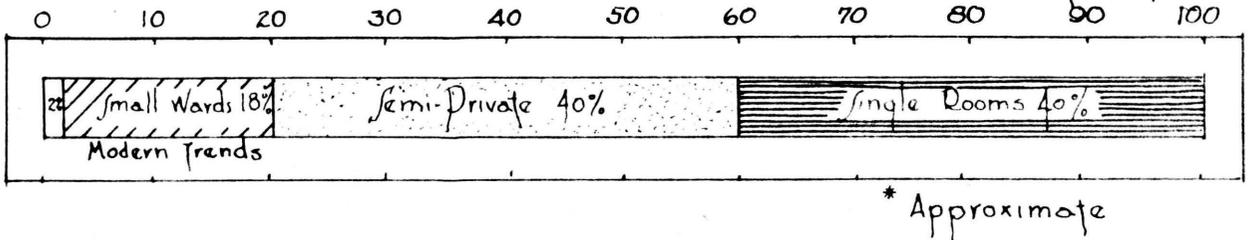


Chart from Niles Carpenter "Hospital service for Patients of Moderate Means"



## PER CENT OF BED DISTRIBUTION ~

Re: TAYLOR

Although an attempt has been made in the 1<sup>st</sup> & 5<sup>th</sup> charts to show the existing trends the figures given were designed on apparent conditions and not on statistics.

tuberculosis, insanity, etc. Of these more will be said later.

In the fourteen years prior to the war hospital development in this country followed a normal development. Large wards were still quite prevalent occupying something like 28% of the total bed area. Small wards took slightly less area using 24% of the space. The semi-private room was little known and on the average occupied but 10% of bed area. Single rooms were quite prevalent and took up the remaining 38% of the space.

Improvements in science and technique brought with the close of the war some very logical changes. In 1918 we notice a slight decline in single rooms and a considerable drop in space allotted to large wards. Small wards increased only 1% over their predecessor, the vast change having taken place in an advance in the use of semi-private wards.

Ten years later(1928) changes in the 1918 hospital were noted in to 7% of the space and the increase the decrease of large wards, of single rooms to 49% of the total bed space.

However, too much faith can be put in the figures of 1928. For in the ten years following the war the country was prosperous and even the small town was looked down upon if it did not have a hospital of its own. The results of the boom came in hospitalization as in all the other affected fields, i.e., the depression awakened the country to the facts that there were far too many hospital beds out of reach of the man for whom they had been built.

To show this clearly let us read an excerpt from the 1935 Report of the Committee on Hospital Planning and Equipment of the American Hospital Association -

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GENERAL BEDS AND THEIR USE

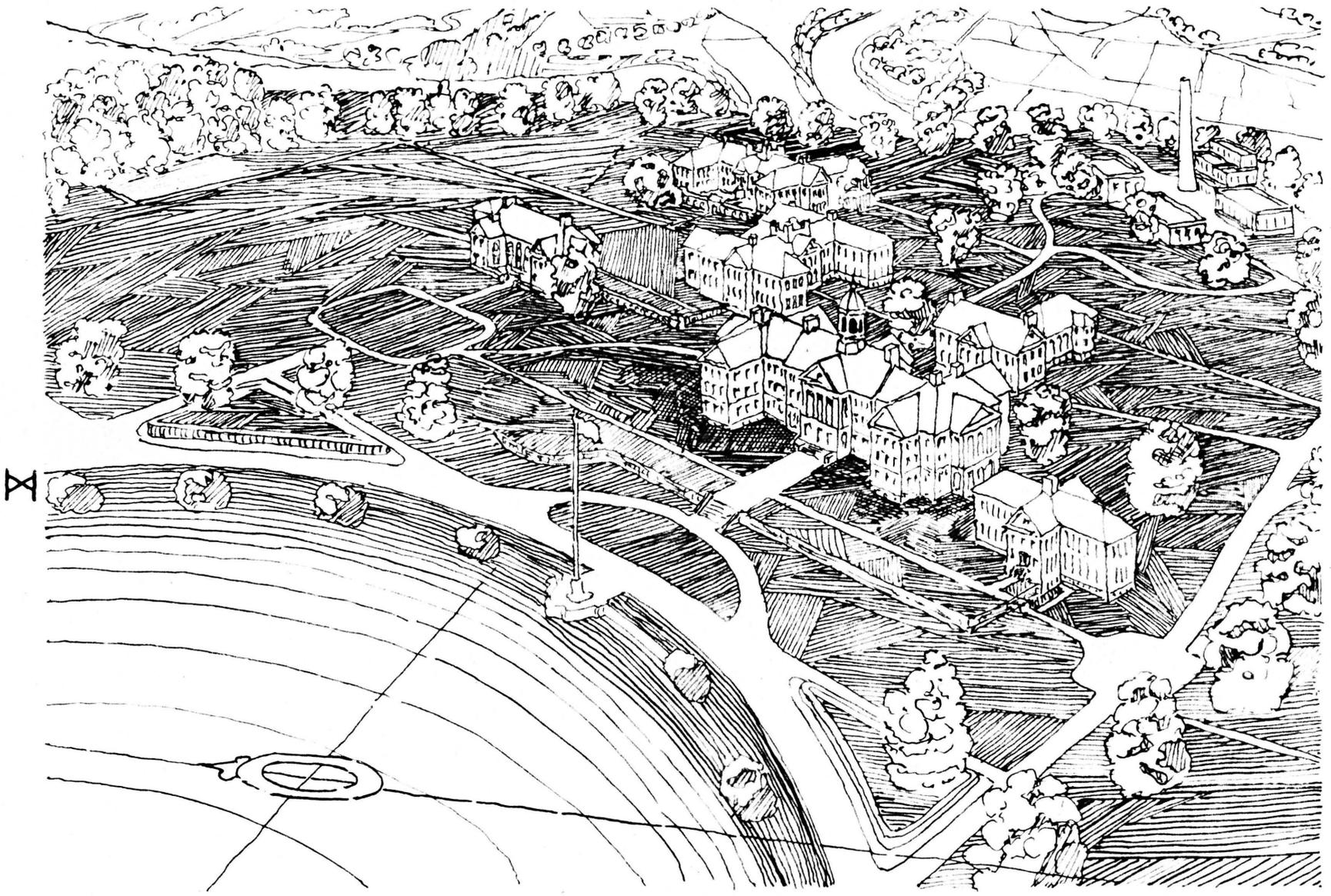
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	1928	1934
Total Beds in 4361 and 4036 GENERAL HOSPITALS	363,000	350,000
Average Daily Patient census 66% and 60% occupancy	240,000	210,000
Average beds unoccupied daily	123,000	140,000
Safe reserve, 25% of average census	60,000	52,500
Excess of beds beyond needs	63,000	87,500
Idle and non-productive investment @ \$5,000 per bed	\$315,000,000	\$437,500,000

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In turn it is unquestionably this over-hospitalization that has caused the average man such financial hardships.

The above mentioned committee writes in continuance: "It may be assumed that the average fixed cost per bed amounts to \$700 a year, \$300 for fixed operating or "readiness to serve" costs, and \$400 for capital charges based on an average investment of \$5000 per bed. This fixed cost would amount to \$44,100,000 on the excess beds of 1928 and \$61,250,000 on the excess beds of 1934. This unnecessary charge, which the general hospitals have unwittingly taken upon themselves, would have met the cost of 8,800,000 patient days' care in 1928 and 12,250,000 days' care or over 18% of the work of the general hospitals,



THE VETERAN'S FACILITY; ROANOKE, VA.  
- A typical government supported hospital for the neuro-psychopathic -

in 1934, at a \$5.00 per diem cost.

By overhospitalization we do not mean that the country has more beds than it does patients who need hospital care. Such is not the case. The mistake made, has been in a faulty distribution of beds. Having been built by the average bloated chamber of commerce or some fame-seeking individual, the average private hospital has been built without proper regard to need or surrounding conditions.

Therefore to combat these conditions, the committee has advanced the following suggestions:

- (a) Better coordination of hospital service between public and private hospitals.
- (b) Closer cooperation between the hospitals of each community to minimize duplication and reduce expenses through central purchasing and collections and the interchange of comparative cost figures, etc.
- (c) The provision of adequate accommodations for chronic and convalescent patients.
- (d) The closing of uneconomical and unneeded hospitals to eliminate excess beds.
- (e) The requirement of a "Certificate of necessity" for any proposed increase of hospital facilities.
- (f) A more careful determination of facilities actually needed prior to new construction.
- (g) More efficient and elastic planning of new buildings to insure a high average of occupancy, and improved methods of construction to minimize operating and maintenance costs.

It is evident that voluntary hospitals are facing a crisis and the only things that can save them are group thinking and community planning.

The modern planner must of necessity plan for flexibility and for the community for which the hospital is to be built. That this flexibility is important is witnessed in the newer buildings which have been built with an elastic arrangement of rooms and small wards and have resultingly operated at 85% to 90% capacity. The American Hospital Association at the present time generally recommends that not over 25% of the total bed area should be allowed for regular reserve. To exceed this figure excessive expenditures are considered inevitable.

As has been touched on before we have noticed that separate and distinct types of hospitals began to come really into their own in the modern day of science. Today hospital architecture is extremely technical and specialized. For each specialized field of medicine there are equally as specialized architectural requirements.

T.J.Young in the June 1935 Architectural Record states the functions of the modern hospital. He divides them into four distinct categories: (1) treatment of the sick or medical function. (2) training of medical students and nurses. or the teaching function; (3) investigation, or the research function; (4) constructive health building or the social function. He points out very clearly that, "in the last quarter century there has been such a rapid expansion of all these functions that it has become increasingly difficult for any single hospital in a community to accept the fourfold obligations."

However, these four requirements have at last been recognized in the latest developments in hospitalization. Namely the medical center. Young describes it as follows: "the medical center is simply a logical economic coordination of hospital and health facilities. Physically, it is a hospital or group of hospitals and their dependencies, frequently linked with

# HOSPITALS - THEIR HISTORY & DEVELOPMENT



ORIGINAL UNIT of SIDLEY MEMORIAL HOSPITAL, WASHINGTON, D.C.  
TYPICAL OF THE LARGE PRIVATELY OWNED GENERAL HOSPITALS  
FOUND IN MOST LARGE CITIES OF THIS COUNTRY - TODAY -



SOUTHSIDE HOSPITAL - - PETERSBURG, VIRGINIA  
TYPICAL OF THE GENERAL HOSPITAL FOUND IN MANY SMALL CITIES  
OF THE COUNTRY. THE GROWTH OF SUCH INSTITUTIONS HAS BEEN MARKED  
BY THE BUILDING OF SEPARATE & DISTINCT BUILDINGS AS THE  
NEED MAY ARISE. EVERY BUILDING SHOWN ABOVE IS A PART OF THE  
- HOSPITAL PROPER -  
TAYLOR.

the medical faculty of a university, and arranged, if properly planned, for orderly expansion of any or all of the hospital functions.

The medical center may serve the crowded population of our largest cities, as do the <sup>two</sup> principal examples in New York City, or it may serve smaller cities, such as does the one in Syracuse. In the future numerous examples of the medical center idea will no doubt be planned to serve regionally the more thickly populated rural districts."

George S. Holderness also in the June 1935 Architectural Record writes of the medical center: "The complete medical center may be considered as an institution containing the following divisions: General Hospital, Maternity, Pediatrics, Orthopedic, Crippled and Ruptured, Isolation, Tuberculosis, Cancer, Convalescent, Neuro-psychopathic, Urology, Dental, Eye-Ear-Nose and Throat, x-ray, Welfare (Social Service) Laboratories, Medical School, School of Nursing.

Every division in this grouping represents an activity to which a separate and complete institution could be and often is devoted. Although some of these divisions are found in the standard general hospital, there is no inherent rivalry expressed in the articulation of the properly balanced medical center. Though distinct in their respective phases of the work, they are bound by a common purpose - the good health of the public."

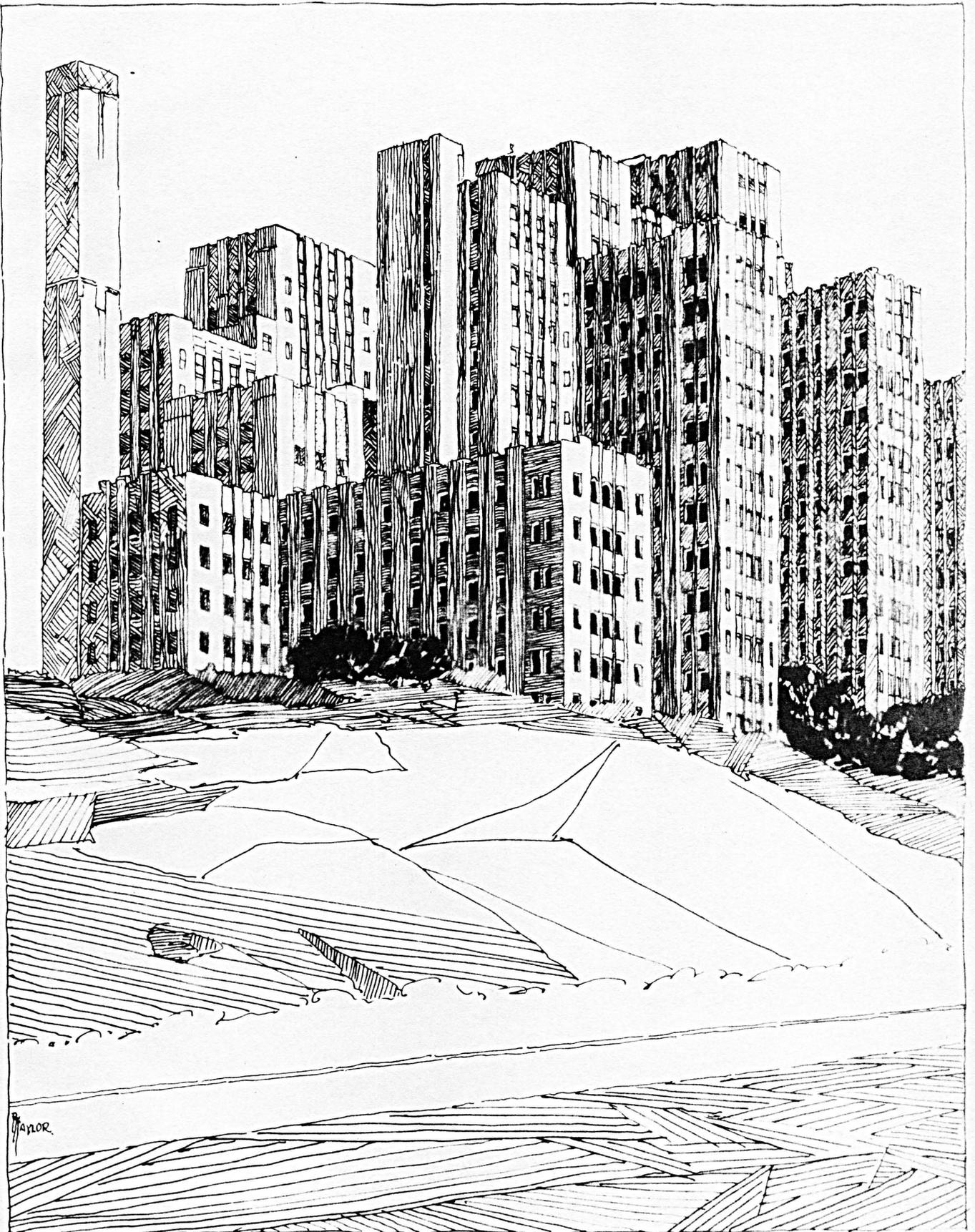
"It should be borne in mind," he continues, "that a medical center is not necessarily an administrative amalgamation. In the case of a grouping of several institutions, of which each has its own plant, it is often found that they are held and administered separately but with a working agreement for reciprocal use of facilities. Among the reasons for this is the fact that the medical center sometimes consists of an assortment of state, county, municipal and private institutions.

In any community, whether it be a metropolis or a small city of 25000, the medical center generally is developed around one or more existing institutions. In many cases, the location of these nuclei determines the site of the proposed group. In other instances the entire medical center is housed in a plant which is entirely new from stem to stern."

Now at first glance of these two excerpts, from the pens of Messrs. Young and Holderness, we are able to see some very marvelous advantages to be derived from such progressive steps. However, laying all due credit to the wisdom of these two men, the fact remains as we have already seen that there exists in the average city and community today too many beds lying idle due to their prohibitive charges. We have seen that this unwise flooding the country with beds has left us during the depression "holding the proverbial bag." Mr. Holderness may say it is all for "the good health of the public", but I cannot in any way justify the building of vast new, expensive establishments when only two years ago, in 1934, 12,250,000 patient days' care at \$5.00 per diem cost went to the support and upkeep of empty beds while the average man for whom they were built suffered elsewhere.

Therefore, it seems evident the present problem should be more the adjustment of what we have to present needs, holding our medical center for the future; at least, until there is a definite need for such.

HOSPITALS • THEIR HISTORY & DEVELOPMENT



Taylor

...FROM A PHOTOGRAPH IN THE "ARCHITECTURAL RECORD" JUNE 1935 ...

THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER IN NEW YORK CITY  
XII

## CONCLUSION

We have seen the hospital originate as a very crude and embryonic structure in ancient history.

Next we saw the influence of Christ's example start the hospital definitely on its way. For 1500 years the church and the hospital were practically under the same roof and as such the institution developed a charitable and friendly atmosphere, that has even to this date been seldom paralleled.

With the reformation came vast religious upheavals that in turn secularized many of the institutions. From that time until 1850 so many abuses in hospital administration were prevalent that we called the period "the dark era" in hospital history.

The rise of the American Institution was first noted in Mexico as the work of the Aztec civilization and strangely enough not the work of Christianity. About the middle of the 16th century, we noted the European influence began to pervade the country after which development hospital construction progressed with the same strides as did the European establishments.

With the Crimean War and the Civil War the abominable hospital conditions were emphasized. The Pavilion System of hospitals, as a result, grew out of a study of the conditions. This type prevailed in popular opinion until the dawn of science, modern medicine and the day of modern invention.

Since that date we have noted the rise of the modern institution and its subsequent expansion into its many and diversified fields.

To go more deeply into the analyzation of each of the modern and specialized fields of hospital development would require more space and effort than I am at liberty to spend. However, there is, to me, a very outstanding conclusion that can be drawn from these few pages. That is, that in hospital architecture of today there is more need for truth in expression of function than has been exhibited in the past.

Unfortunately we Americans may continue to copy stone for stone the 13th century Gothic cathedrals as an expression of our modern religions and we will probably continue to house our modern bankers, lawyers, and various governing bodies in the "Grandson of the Greek Parthenon," but one thing is evident, and that is, that the hospital of the present and future, owing to its very nature; its complicated and functional character must always be designed for only the needs for which it is to satisfy. To do otherwise, i.e., to adapt such a highly organized structure to some petty style would undoubtedly result in the defeat of the primary purpose, the good health of the public.

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The End

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