

The Evolution of the Mission and Design of the Hospital

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In 1773, long before Le Corbusier called the home a “machine for living,” and two centuries before its proponents saw a “selling machine” in the shopping mall, the Enlightenment scientist Jean-Baptiste Le Roy proclaimed the hospital ward to be “a machine for treating the sick.” Le Roy was not describing the hospital ward as it was, but rather advocating for what it *ought* to become, given that science and philosophy had already begun to regard the human body as a machine. Belief in the mechanical “nature” of life, continuing to this day, has influenced both hospital’s design and the medicine practiced within it. But Le Roy’s machine metaphor also sharpens the social paradox at the core of the hospital: how does an institution offer care while rationing it? How can it provide an umbrella of universal refuge while selecting and differentiating among patients? How best to extend relief to the suffering in a world of limited resources? This tension between utopian expectations and concrete reality, expressed in a thousand ways, runs throughout the evolution of the hospital. The current tug of war between the unquantifiable ideal of “wellness” and the drive to rationalize care and cut costs, makes all the more urgent a re-examination of the social beliefs and architectural practices that continue to shape the hospital.

Today oncological surgeon Bernie Siegal advises his patients to pay attention to their dreams, testifying to a knitting together of the mind-body split taking place within Western medical culture. But in Greece from the fifth century B.C. and later across the Hellenized world, the roles of priest and physician were fully integrated. The sacred message and healing act came together under one roof. In the “halls for dreamers,” temples to Asklepios, patients lay waiting to dream the god’s prescription. Sheltered by porticoes opened south toward the sun, the gurgling mineral springs in which they had just bathed lulled them to sleep. Their dreams revealed their cure. Upon awakening, physician-priests administered Asklepios’s divine injunctions, however outlandish. If a patient was too sick to travel to the temple, a stand-in might dream and receive treatment on their behalf – long-distance cures were considered no less effective. By the second century A.D., the Asklepieion complex at Pergamon, in addition to separate

halls for dreaming and treatment, offered radioactive mud baths, a theater and sports stadium – all the comforts of a fully integrated health and entertainment complex.

A more secular approach to medical care, based on Hippocratic theories, was also available in “iatreia,” clinics for the consultation and treatment of private patients. Here, as well as in Hellenized Rome, hospital care for soldiers, orphaned children of military families and impoverished citizens of standing was a state obligation. Emperor Claudius extended charity care to sick and dying slaves at Asklepieia and iatreia built on an island in the Tiber. *Valetudinaria*, standardized military hospitals, were adapted to large agricultural estates, to maintain the functional health of their human assets.

After the fall of the Roman Empire in the west, the Christian church controlled the design and administration of hospitals for several hundred years. Hospitals became the sites of a divine mission, offering mostly non-interventionist, palliative care with emphasis on comfort and the cure of souls. Hospital, hospice, hostel and hotel all derive from the Latin *hospes*, the guest or the host. Sometimes the hospital was called *domus dei*, home of God, or more frequently *domus pauperum*. This was a holy poverty – Christ’s poverty. St. Jerome eulogized a fourth century hospital founder for “carrying on her own shoulders poor filthy wretches... how often did she wash away the purulent matter from wounds which others could not even endure to look upon!” In exchange for their hospitality, donors and care givers hoped to be “fortunate enough to be taken into the bosom of Abraham.” It would be centuries before nursing brothers were kissing the wounds of crusaders and pilgrims in the far-flung hospitals of the Order of St. John, but the confluence of physical and spiritual care took root early on, along with the ideal of the hospital as a refuge, asylum and primary care unit open to all.

In the fourth century A.D., the relatively robust Eastern Empire saw the beginnings of area-wide health planning and patient differentiation recognizable today. In 325, the Council of Nicea decreed that each town build its own “xenodochium” for sick and ill travelers. The Mediterranean port of Caesarea housed the first hospital “complex,” incorporating pavilions for the sick and for pilgrims, an infirmary, leprosarium and workshops for the disabled and unemployed. The Basiliade, named in honor of St. Basil, offered care to a high volume of diverse patients, and was located, not by chance, at a vital spiritual and commercial hub.

As hospitals proliferated across Byzantium, elements of the Basiliade model were appropriated for what became a standardized plan: wards and services ranged around three sides of a porticoed courtyard with a basilica completing the rectangle. By 610 A.D. there are records of four maternity hospitals in Alexandria, and forty hospitals and hostels of various kinds in Constantinople alone. Some designs prefigured the monastic functionalism later idealized in the famous plan of St. Gall. Eastern Empire hospital design reached its most modern form in twelfth century Constantinople where the Pantocrator complex incorporated two latrines, a pharmacy, kitchen, butchery and laundry. The menu changed daily, and precise inventories of supplies and equipment survive, as do detailed schedules for the hospital's numerous personnel. Pantocrator also featured a high level of medical differentiation. Fifty beds were divided into sections of ten: one each for surgical and medical male patients, one for women, and two for less serious illnesses.

Records of differentiation by economic class can be traced to the fifth century, with money, of course, buying privacy and a richer diet. It would be hundreds of years before differentiation by race achieved its most refined form. In the late nineteenth century, Johns Hopkins Hospital in Baltimore, added a discrete "negro" pavilion connected to the autopsy laboratories at the farthest geographical remove from the central "pay" wards. In the 1960s, with overt segregation now legally impossible, the Johns Hopkin's administration built an imposing wall between the hospital grounds and the adjacent black community. Even in cosmopolitan New York City, in an era of presumptive equality, the hospital has never quite lived up to its utopian dream. Until quite recently, Mount Sinai Hospital housed its Medicaid maternity patients on a different floor from those privately insured.

But in the early middle ages, the indigent and ill combined to form a class that was, for a time, more than rhetorically celebrated. The Rule of St. Benedict, the ideological bedrock of European monastic hospitals, insisted that "every arriving guest must be welcomed as if he were Christ" and that "before all things and above all things, care must be taken of the sick...." Charity care was made compulsory for abbeys and it was every bishop's duty to maintain a hospice for the poor and travelers. The revival of Augustinian precepts encouraged incorporation of social work into religious practice. One medieval hospital records serving "the poor, pilgrims, transients, pregnant women,

abandoned children, the halt and the lame – in fact, everyone.” No longer just a refuge for the indigent sick and travelers, the hospital had become a bulwark against the tides of social dislocation.

Fernand Braudel’s dictum “he who gives dominates” points to patronage as a defining force in the evolution of the hospital. War has been another. Today’s prefabricated modular civilian hospital units were adapted from military models and modern patient classification derives from military ordering. With the reinvigoration of urban life in Europe came hospitals founded by guilds, noble patrons and eventually the untitled wealthy. But being born, being sick, recovering and dying were still mostly done at home, with the hospital considered the refuge of last resort. The infirmary at Ourscamp was known as the *salle des morts* – and in the medieval mind, death was seen as a recovery. This resonates with both the Platonic idea of death as the “cure” for life, and with the contemporary belief that a patient may be “healed” and still die.

Throughout the early middle ages, hospitals, both military and civilian, grew in number and size, and continued to expand their social dimension. The Order of St. John of Jerusalem, known as the Hospitallers, combined the imperatives of holy war with tending to the sick and poor in the Levant. In the eleventh century, a merchant from Amalfi founded a hospital for sick pilgrims in Jerusalem near the church of St. John the Baptist. Later, the hospital was taken under papal protection and added tending to sick and wounded soldiers to its original mandate. Over several centuries, the Hospitallers became highly capitalized hospital builders. Backed by the power of the church, yet operating semi-autonomously, the Order may be seen as the medieval precursor of today’s health care conglomerate. In the sixteenth century, the far-flung Hospitaller institutions were centered in Malta, where the gigantic magnet hospital at Valetta attracted patients from all over the Mediterranean. Its huge ward, 502 feet in length, was divided into separate surgical and medical sections, with an isolation ward for infectious diseases, rigorous dietary supervision, and relatively humane treatment of the insane. This hospital also prefigured the “niche” hospital – ophthalmology was its specialty – and served as an early clinical teaching institution at a time when medicine was largely theoretical. In the late seventeenth century, when the practice was still forbidden in domestic hospitals, the Order’s anatomists dissected dead knights and lay patients.

It is tempting to think of the middle ages as period of social stasis: as a time of fixed, monolithic institutions, slow to change and spared from the relentless Post-Fordist imperative to be “flexible.” But medieval hospitals exhibited a great diversity in size, design and function. Frequently, as at Bath, they were built near purportedly medicinal waters. They ranged from small institutions housing a dozen “inmates” to huge estates whose “charitable acts” included making loans in order to “free” indebted landowners from their Jewish creditors. Occasionally, one finds a “company town” where whole communities were organized around the a hospital which had become the largest local employer. Monastic orders pioneered specialization: the Lazerites cared for lepers, the Antonites for diseases of the skin, and there were separate foundling homes and asylums for the blind and insane. St. John the Baptist in Chester was founded for the “sustenance of poor and silly persons.”

Medieval hospitals were also subject to enormous social pressures, and mutated accordingly. Then, as now, the crisis of hospitals derived from the gap between the hospital’s ideal and what it could actually accomplish. By today’s medical standards, medieval hospitals couldn’t do much. Physicians practiced an essentially theoretical medicine based on regulating the four Galenic humors, to balance physical and mental well-being. Surgical intervention often proved fatal. At St. Laurence Hospital, Cambridge, the brothers were exhorted to wash their hair monthly “lest their smell disturb the inmates.” But standard hospital treatments included bed rest, warmth, relative cleanliness, and a far better diet than was generally available to indigent outpatients. Even from today’s perspective, this regimen, accompanied by hot baths and the delousing of clothes, seems an enlightened baseline of primary care. The medieval hospital was no place to take your multiple traumas, but it might save your life if you were on the way to getting sick with a preventable ailment.

In the fourteenth century, European hospitals entered a period economic crisis. The gradual abatement of leprosy depopulated many hospitals depleting their endowments. Some leper houses responded by diversifying: one became a home for pregnant women, another a school. Others closed altogether. Coinciding with the decline of leprosy, came the bust phase of the great feudal agricultural boom with extreme pauperization of the countryside and recurrent famines, soon compounded exponentially by the Black Death. By law, the poor were tied to their parishes, which

were compelled to care for them. But with the rural economy in a nosedive, the existing hospital network faced economic implosion and radical shrinkage. Impoverished hospitals, even those founded to receive the sick were forced into policies of exclusion. A typical edict directs that “no lepers, lunatics, or persons having the falling sickness or other contagious disease, and no pregnant women, or sucking infants, and no intolerable persons, even though they be poor and infirm, are to be admitted to this house....” Of 112 hospitals providing care for the sick poor in England and Wales in the fourteenth century, only 39 remained active in 1535. As in today’s “competitive” health care environment, some hospitals weathered the change – many others disappeared.

The massive social dislocations of the fourteenth century brought a crucial shift in attitudes toward the poor. With its mass production, poverty lost its idealized, Christ-like nobility, giving way to the concept of the “misbehaving” poor. Indigence no longer symbolized virtue, but embodied social disruption and discouraged philanthropy. Seen as providing an incentive to shirking and wanton procreation, charity care fell into disrepute. In France, hospitals became a tool of labor legislation and transformed into prisons and recruitment centers for able-bodied beggars. With the depopulation of the countryside, concentrated poverty became an urban phenomenon, and the charitable focus shifted toward city hospitals with greater access to patronage.

The hospital took its place at the forefront of institutional secularization, a process that it never entirely completed and may, in fact, be reversing today. The increasing dichotomy between physical and spiritual existences took form in the evolution of the open ward into the ward-chapel combination. Adapted from the monastery, the standard open ward featured generally undifferentiated bed space, an altar, kitchen and privies. The beginnings of a double function begin to show with a split in fenestration. At the Hôpital Notre Dame des Fontenilles in Tonnerre, sealed “sacred” windows flooded the room with transcendent light, defining the chapel area, while “profane” or “secular” windows, designed to control ventilation defined the ward. In combined chapel-wards, the architecture might differ radically between adjacent sections. The application of materials carried symbolic value: the ward might be built of wood, but the chapel was always constructed in “eternal” stone.

The open ward retained its utility for centuries, evolving in functional sophistication. By the eighteenth century, the huge “sick-ward” of St. John’s Hospice in Bruges had been divided into rows of boxed-in beds, built end-to-end like sleeping car bunks. Each row functioned as a semi-autonomous department, with separate men’s and women’s sections, a “surgeon’s row” and a “corner for the dying.” A detailed contemporary painting shows the delivery of patients via sedan chair, food preparation at one end of the ward, a cat hunting for scraps, a gamboling dog, a dying patient receiving a blessing. The Superior escorts a benefactor down one aisle while a servant mops another. Given the enormous space and blocked sightlines, it would have been impossible for all patients to see a common altar, so a movable one is provided. Wherever one looks, conscientious care is being given to the sick, but there are no doctors in sight.

In Renaissance Italy, cruciform hospitals evolved from the cross shaped church. It soon became clear that this configuration offered two advantages. It enabled every patient to see mass and also facilitated their observation by hospital staff. In 1456 the Milanese duke Francesco Sforza sent the architect Filarette to study the cruciform hospital at S. Maria Nuova in Florence. On his return, Filarette designed the Ospedale Maggiore, two large crosses separated by a courtyard and chapel. The plan, a huge rectangle 1000 feet along its facade, called for open colonnades on the ground floor for circulation of the sick, provisions and laundry. In his *Treatise*, Filarette described water stored in a tank supplying each ward, along with automatically flushing lavatories between each bed. Despite the sophisticated sanitation, the dead, buried on-site in increasing numbers soon provided the hospital with both a health hazard and daunting omnipresent smell. By the end of the seventeenth century, a new burial ground was opened up beyond the city limits and the deceased left the Ospedale via two separate portals: the wealthy departed from the main gate while the indigent left by a back door, crossing the Naviglio on the “Bridge of the Poor.”

Cruciform hospitals proliferated in northern Italy and Spain, and were also built in France, Germany and England. The cross hospital followed the path of colonization across the Atlantic – Cortés founded one in Mexico City. With eighteenth century utilitarianism, the cruciform hospital sprouted additional spokes and evolved into a radial panopticon, from whose crux all inmates could be centrally observed. Jeremy

Bentham had proposed the panopticon as a prison, but it proved readily adaptable to hospital design. In 1839, on Blackwell's Island – now Roosevelt Island – in New York City, Bellevue Hospital built two arms of a panoptical cross as a Lunatic Asylum for the Insane. Its central section survives in ruins today.

By the fifteenth century, northern Italian hospitals seamlessly integrated their charitable function with real estate and banking. S. Maria Nuova acted as a private lending institution, offering low interest loans to its large investors. In 1527, its directors were dismissed for allowing their Medici friends to charge 14% interest on money that they had just borrowed from the hospital at 5%. Hospitals often had huge budgets and substantial holdings in private homes, commercial shops, marketplace stalls, farms, fields and vineyards. Given the high rate of contemporary bank failures, hospitals proved a relatively safe investment and helped stabilize the emerging credit market.

With the scale of poverty diminishing, northern Italian hospitals shifted from caring for the poor to the sick poor in particular and eventually, to a wide social spectrum of the sick. In the process, the hospital was gradually transformed from a general refuge into a specifically medical facility. From the early fifteenth century there were 35 institutions in Florence listed as *ospedale*, and this was not atypical. Many contemporary cities averaged one hospital per thousand inhabitants. On his journey to Rome in 1510-11, Luther passed through Florence and praised its hospitals' "regal buildings, with finest food and drink, attentive service, very learned physicians, and clean beds."

At the Hospital of S. Giovanni in Turin, clinical and administrative practices foreshadowed the sweeping reforms of the eighteenth century. Here, from the 1500s, physicians and surgeons conducted twice-daily rounds. The duty of "dresser" was carried out by younger surgeons, employees-in-residence, who were often ex-foundlings of the Hospital. Benefactors created positions for full-time assistant physicians who observed the progress of diseases and reported to the chief physician. S. Giovanni may be said to be the first doctor-centered hospital, one where senior physicians played a central – and often dynastic – role in determining medical practice, design and administration. Their power came in part from their ability to bring in wealthy private patients who supported the hospital with fees and bequests. Doctors

changed their socio-economic status, becoming privileged workers, while at the same time gaining a direct financial stake in the health of their institutions.

Gradually medical care, particularly for the expanding middle-class, had been leaving home and admitting itself to the hospital. But in the wake of a series of debilitating political and economic struggles Northern Italy's now-medicalized hospitals ceased to function as municipal institutions and were taken over by the state. This shift toward centralized government broke the political power of the hospitals but failed to yield promised social and medical efficiencies. Instead, the wresting of political and economic control of hospitals from the hands of doctors precipitated a general collapse of organized care in northern Italy.

But interventions by the absolute state did nothing to derail the movement toward increased medicalization of hospitals. In France two centuries after the Italian Renaissance, the large hospital became a teaching and research institution linked to a university faculty. A focus on practical knowledge gained through direct observation of diseased organs pushed theoretical medicine to the margins. Hospital service was now compulsory for medical students, and served as a career path to directorships, military posts or provincial practice. Many hospitals, such as Wren's Royal Naval Hospital at Greenwich, were built to resemble palaces – following a line of hospital conversions of former grand residences. In England, the infirmary – often run as a joint-stock venture – re-equated medicine with charity. Here care of physical ailments replaced alms-giving. The infirmary became the locus of private, “voluntary” contribution – the philanthropic target of manufacturers and merchants, as well as land-owners and nobles, and increasingly, middle-class donors. “In Faith and Hope,” wrote Alexander Pope, “the world will disagree. But all mankind's concern is Charity.” The idealized infirmary also represented a rationalist, utilitarian institution situated between the “Scylla of sentiment and the Charybdis of calculation,” fusing a “heart of generosity with a brain of utility.” Joseph Priestly, the great chemist-clergyman praised the infirmary as: “the cheapest of all charities, the most good being done with the least expense.”

A new covenant was established with the poor who were now expected to pay the care they received – not with money, but with gratitude. Gratitude was also to be expressed in docility, in *patience* – in the willingness to consume equal doses of

medicine and religious improvement. Entering the Salop infirmary in London, patients saw two lists: "What the Patient May Expect" and "What the Charity Requires." Here the hospital's mission turned toward a balancing of the social books. As a "vehicle for practical benevolence," the hospital "clasps hands between social ranks" and bonds them together with "friendly cement." Rich and poor were brought together – if not into proximity – in a healing site that sought to ameliorate naked class antagonisms – even with poor laws continuing in force and stealing still a capital offense.

From where we sit today, it is easy to see the hospital of the early industrial era as a strategic site for the containment of social conflict. But a quantum shift was also occurring, both in clinical practice and in the social understanding of medicine – one that Michel Foucault, in *The Birth of the Clinic*, has distilled as the difference between "what's the matter with you?" and "where does it hurt?" The great reformer-physician Tenon's program for turning the hospital into a "temple of nature" designed in the "image of man" catalysed new modes and methods of classification, observation and diagnosis – what Foucault calls the transformation of "sickness into spectacle." During the French Revolution, the health and welfare of the entire population became a central political goal of – and justification for – the modern bureaucratic state. As distinct from ancient and feudal ideals, the sacred mission of the state now turned to the mass production and consumption of social and medical well-being. But for the moment, another kind of hospital persisted – the "temple of death," incapable of containing either social or medical malaise – a hospital that could not even control itself.

This hospital still claims a place in our imaginations as a true chamber of horrors, its fearful chaos never entirely vanquished by scientific and philosophical rationalism – its shadows resisting penetration by the Enlightenment and two hundred years of subsequent clinical advance. This is the triumphant moment of "hospitalism": the hospital *as* disease itself. What is now called a general hospital, could, as late as the eighteenth century be an undifferentiated nightmare of limitless suffering.

Bicêtre, in Paris, began as the first Hôtel des Invalides, founded by Louis XIII. Twenty years later it had become a poorhouse and in another four years the insane were admitted. Soon juvenile delinquents and adult criminals were added to the mix. By the time of Tenon's report of 1788, Bicêtre was filled with "the poor young and old, able or invalid, the mad, the imbecile, the epileptic... the blind [and] all kinds of

incurables.” Similar conditions were found at the Saltpêtière. But the most infamous recorded hospital remains the Hôtel-Dieu, founded in 829 – at approximately the same time as St. Gall – and built just west of Notre Dame on La Cité. By the thirteenth century it consisted of four long, two-naved wards, three in a row and the fourth at a right angle. At the end of the middle ages it had 450 beds, accommodating 1,300 patients without differentiation as to illness. About two thousand patients died there annually during the fifteenth and sixteenth centuries with 5,729 recorded mortalities in the peak year of 1524. Throughout, the Hôtel-Dieu continued to expand. By the seventeenth century it had leapt across the Seine to the Left Bank, incorporating a bridge, the Pont de l’Hôtel-Dieu, into its structure as the Salle du Rosaire. In the Hôtel-Dieu we find a truly integrated, pathological inversion of everything curative: the hospital as pestilence. In the same ward, surgeons might dissect a corpse, then use the same instruments to operate upon a fully conscious patient. In one bed a couple might conceive a child, next to a patient undergoing bloodletting or swallowing an electuary, while nuns sewed the recently expired into their funerary sacks – all beneath the omnipresent crucifix.

Into the eighteenth century the Hôtel-Dieu had a mortality rate of one in four and remained entirely undifferentiated, three centuries after the Renaissance architect Alberti had pleaded for a system of separation by malady and age group. When two fires destroyed much the Hôtel-Dieu, the tragedy sparked a wide-ranging debate over how and where to rebuild it. Le Roy, whose concept of the hospital begins this article, proposed his machines for treating the sick as parallel rows of single story wards, designed for maximum ventilation and flanking a courtyard. Previously Bernard Poyet, a successful prison designer had suggested a 500 bed panopticon with sixteen radii on the Ile de Cygnes. Neither this plan, nor Le Roy’s, nor one to build four 1200 bed hospitals at cardinal points outside Paris, were adopted. The Hôtel-Dieu’s rebuilding waited until the mid-nineteenth century wave of medical reform ushered in clinical and architectural precepts we identify as modern.

But by the late 1700s, the scientific and secular characteristics of twentieth century hospitals had already emerged. The Enlightenment hospital was no longer content to be a poorhouse or a “temple of death.” Instead, it insisted, with scientific rationalism, that knowledge is empirical, and that cures without limit were achievable.

Hospital ceiling heights were now based on the results of Lavoisier's experiments in respiration, and the diseased organ became the object of relentless observation. The hospital was structurally redesigned around the objectively calculated needs of the sick individual, and its activities scientifically geared toward maximum efficiency.

Utilitarian rationalism, however, either ignored or repudiated the boundaries of incurability. As a consequence, care shifted from the treatment of chronic complaints toward conditions that lent themselves to successful medical intervention – an intervention that became ever more precise, confident and aggressive. Already stringent admissions policies – in England a letter from the parish priest was necessary – were further tightened up to exclude a wide variety of categories, especially incurables. Many clinics now admitted no pregnant women, children or incurables. An English hospital records “Margaret Barnfield rejected as being in a dying condition with dropsy (edema) and Gutta Serena” (neurologic blindness). But the sick, and in particular sick children, were also taking on a new role as “objects of instruction” and the clinic became a place where “those case which seem most instructive” could be brought together as “suitable subjects for an experimental course.” At the maternity clinic at Copenhagen only unmarried women were admitted, prompting a French medical reformer to state that “nothing better could be imagined, for it is precisely that class of women whose feelings of modesty are likely to be the least delicate.” Not being in a position to “exercise beneficence” they might “at least contribute to the training of good doctors and repay their benefactors with interest.”

Eventually, a kind of high rationalist madness was achieved during the French Revolution when, under the rallying cry “no more indigents, no more hospitals,” it was proposed that hospitals – blamed for causing poverty – be done away with altogether. Here poverty was viewed as an economic consequence of the old regime, disease as an individual accident. The revolutionary state promised to eliminate poverty, making hospitals unnecessary. Diseased individuals were to be treated and cured within the province of their own families, without state intervention. Beneath this attack lay a hatred of the hospital as a religious, economic and political agent of oppression. But the idea of the emerging “natural” state automatically eliminating poverty and illness does not seem so distant from the prevalent contemporary belief that the market's takeover

of the outmoded public sector will usher in an era of universal prosperity and well-being.

The medicalized focus of the eighteenth century laid the groundwork for new forms of clinical practice, design and administration which resulted in the explosive growth of both general and specialized hospitals in the nineteenth century. Opening with a theory of contagion via “miasmas,” the 1800s ended with bacteriology, asepsis and anesthesia. If modern medicine was considered a war against disease, then by the close of the century, the forces of science appeared to be winning. The science of design also achieved what O. F. Kuhn, in his 1897 *Handbuch der Architektur* termed “the most perfect form of hospital architecture,” the pavilion plan – separate low rise or semi-attached structures connected by corridors.

1810 saw the opening of the last of the great palace-hospitals, an immense three story structure with five bays. Visiting England, Schinkel lauded the Derbyshire General Infirmary as “beautiful, convenient in every respect, with a superb staircase... all is very intelligently arranged.” Despite its advanced air heating, lavatories, baths and laundries, patients nonetheless died at an alarming rate. Perhaps, thought Florence Nightingale, the problem was a combination of design, sanitation and organized, quality care. At the Scutari military hospital near Constantinople she had personally succeeded in reducing the death rate from cholera and dysentery from 42% to 2% with the application of basic nursing, organization and hygiene. Now she wanted to go further. Medical orthodoxy of the day remained convinced that many hospital deaths resulted from the concentration of poisonous gasses. Nightingale and others believed that pavilions – detached or semi-detached buildings ranged along each side of a central avenue or elongated courtyard – would provide the light and air circulation vital to restoring patients’ health.

Nightingale took the Hôpital Lariboisière in Paris for her model. Here, in 1854, an institution had been created that, according to contemporary accounts, ushered in “a new epoch in hospital buildings,” presenting “all the conditions of well-being and healthiness.” The design featured an administration center and a chapel at opposite ends of a central court. The wards pavilions were arranged in two parallel rows of four, each unit having thirty-two beds. Nightingale successfully fought for the adoption of the pavilion scheme for the Royal Victoria Military Hospital to be built at Nettleby. The

new hospital featured open, spacious, utilitarian Nightengale Wards and an Italianate facade – an esthetic that became the clinical equivalent of the International Style. Eventually the Paris Hôtel-Dieu was rebuilt with a pavilion scheme, scaled down to 650 beds. Winning wide acceptance as the most progressive hospital design, pavilion hospitals were built in the U.S. at Johns Hopkins in Baltimore and the Free City Hospital in Boston. The ultimate extreme mutation of the pavilion scheme was the colony group, whose most heroically bizarre realization occurred in the 1904-07 Steinhof Asylum near Vienna, where detached pseudo-baroque structures constellate symmetrically around a central chapel, all set in an immense park.

A final important nineteenth century development was the specialty hospital. Hospitals opened in London for eyes, ears, chest complaints, stone and urinary diseases, orthopedics and cancer. Prototypes for medical niche marketing, these hospitals were often founded by entrepreneurial doctors frozen out of profitable general hospital practices seeking “fame and fortune by means of bricks and mortar.” Established institutions took the public position that specialty hospitals were run by quacks, but also hired doctors and added beds for specialty patients. Many specialist hospitals went out of business. Surviving institutions eventually gained acceptance as legitimate medical establishments.

Florence Nightingale’s reforms focused on the organizational and medical advantages of the pavilion plan. But if bacteriology was correct, and the spread of germs could be contained without physical separation, then the pavilion was obsolete. Instead, great efficiencies of heating lighting and transit might be achieved through building “compact, many-storied buildings” known as monoblocks. So said M.J. Ochsner and A.J. Sturm in their 1907 book *The Organization, Construction and Management of Hospitals*. Writing in the era of scientific management and the skyscraper, the authors claimed that air moves faster and is less polluted at higher levels and that monoblocks would cost 40% less than pavilion designs to repair, heat and maintain. The practice of stacking functions in a rationalized highrise order, so familiar today, became known worldwide as the American Hospital. In 1928 Columbia-Presbyterian took advantage of the monoblock’s highrise efficiencies. On Manhattan’s east side hospital row, now known as “bedpan alley,” Skidmore Owings and Merrill designed a state-of-the art medical center for New York University in the 1950s. At this

writing, these, and scores of other private and public hospitals built quite recently are stuck with buildings that are considered obsolete and which they can no longer afford.

It now costs roughly a billion dollars to construct or replace a large hospital. New hospitals shun the monoblock in favor of more “flexible” approaches. Facilities being rebuilt, such as New York-Cornell Medical Center, are abandoning the cramped rooms and labyrinthine corridors of their 1930s highrises. The new American hospital, one with less beds, better views, and more technology, must reconcile the imperatives of “competition” and managed care economics with a projected image of radiant wellness. The promised convergence point of medical-structural-economic efficiency keeps receding into the horizon. Far more hospitals are shrinking or closing than are being built or expanded. Others, even respected, solvent institutions with identifiable brand names are putting the best face on their shotgun mergers. Patients, doctors and hospital administrators are all running scared. Why? The answer lies in the gradual transformation of medicine into an economic discipline.

The provision of charity care in the Dickensian infirmary offered a strange prefiguration of the first of twentieth century health care’s economic revolutions: third party payment. In the antique charity ward, treatment was given, gratitude expressed and the books were balanced *with no actual money being exchanged*. Thus for those receiving care, as well as for those directly administering it, the finances of medicine could become, over time, a remote abstraction. Our own sense of distance from the hospital economics coincides with the weaving together of a social safety net which is now in the process of unraveling.

First came Workmen’s Compensation in 1910. Blue Cross and Blue Shield were introduced during the Depression, intended, in part, to preserve hospitals as they existed. In 1948, the federal government allocated enormous sums toward hospital building. Medicare and Medicaid are creatures of the 1960s Great Society. Taken together, these developments greatly broadened access to standardized health care and hospital treatment. Billions of dollars entered the nation’s health care system. But while this net was being woven, other forces were at work that altered the balance of the hospitals’ power. The cultural authority of doctors – undermined by the mass production of health care and physicians’ loss of direct contact with patients – coincided with a decline in doctors’ decision-making power in hospitals. Cost-conscious

professional administrators gained influence and raw economics increasingly determined how hospitals were run. With rising costs and the explosive growth of the insurance industry, power shifted yet again, from hospital administrators to insurers. Just at the point where hospitals were distributing their medical “miracles” most democratically, new opportunities opened up to extract profits from the system by rationing care. Today, the government officially sanctions HMO policies of rewarding physicians for restricting services to Medicare and Medicaid patients.

The provision of health services now depends almost entirely on its profitability. The prevailing view of corporate-minded politicians at federal, state and municipal levels is that government does not belong in the health care business and should divest itself of its health care assets. To save themselves hospitals must cut costs, merge in order to realize greater economies and capture markets and generally begin to function like, and among, other competitive business entities. The hospital, the final holdout in the total commodification of health care, must now drastically rewrite its traditional mission statement if it is to survive.

Until very recently, American hospitals were embedded culturally in the life of their communities. Some, like New York’s Harlem Hospital became models of public sector clinical achievement, as well as symbols of their community’s survival and resilience. With privatization and the trend toward for-profit hospital chains, “community” no longer implies parish, or neighborhood – it means the investor pool. Daniel Sisto, president of the Healthcare Association for New York State, a not-for-profit lobbying group, notes that “For-profit hospitals are economic institutions with social implications. Not-for-profit hospitals are social institutions with economic implications.” What forces continue to drive current trends? According to John Ronches, president of the Committee of Interns and Residents, a national house staff organization, they are simply “greed and fear.”

Very little concerning the future of the hospital can be predicted with certainty, especially in the U.S. where, unlike the rest of the world, most hospitals are private. But if present tendencies continue, two developments are likely to occur. First, the hospital will become a thoroughgoing creature of the marketplace. The financial bottom line will displace the clinical base line, wherever it not already done so. Hospital mergers “downsizings” and “shrinkages” are likely to accelerate. Hospital staff will continue to

be replaced by machines wherever it is economically and technically feasible. The ideal patient will be one who's got lots of insurance coverage, but isn't particularly sick.

Second, poor people, particularly those on Medicaid, and the 41 million Americans who can't afford coverage, will receive less medical care – as will many of those enrolled in private insurance plans. No honest spokesperson for managed care attempts to deny the role of their medical and administrative gatekeepers in controlling costs. As private hospitals tighten admissions policies to maximize reimbursements, the poor and uninsured will be caught in a double bind. The cash-strapped public system will close its clinics or restrict access, cut back on services, and be generally less capable of providing quality care. In New York City in 1994, Mayor Giuliani proposed a plan to turn the nation's largest public hospital system over to private companies. This plan has foundered, partly because of community resistance and partly because the city hospitals' aging physical plants serve a high proportion of poor patients and are seen as a bad investment. In addition private hospitals, struggling in a competitive market, either cannot or will not commit scarce resources to acquiring public facilities. With privatization proceeding at a snail's pace, New York's public hospitals, drastically underfunded, are simply withering. Soon there may be nothing left to sell.

One thing may be said with confidence: the crisis of the hospital reflects a crisis of the social fabric. This crisis presents itself as economic but its causes go much deeper – to a struggle within the culture's consciousness, manifested in the debate around the changing mission and design of its institutions. At bottom, this struggle is over how to distribute and rationalize admittedly vast, but presumably shrinking social and economic resources. Who should get what, and how? As long as the debate over health care continues to be framed by the necessity to produce investor profits, this struggle will be long and ugly indeed. And the social cost of rationing primary and secondary care will prove unimaginably high.

How are hospitals responding to their crisis? Some institutions are shutting down, hanging up the sign NMTBD: no more to be done. Once this was written across the charts of the terminally ill. Other hospitals, less economically and morally paralyzed, are primed for competition, redesigning and rebuilding, restructuring their mix of services and demographics, developing profitable niche specializations and spending heavily on public relations and advertising. Recently Beth Israel hired away

two of New York University's medical superstars and is designing a multi-million dollar pediatric neurosurgery center around their highly reimbursable services. At Beth Israel as at other private hospitals, the traditional association between medical care and hospitality is returning in a new form as administrators attempt to create a more hotel getaway-like atmosphere. Overall there is a movement to make hospitals feel like anything but medical institutions.

In publicity terms, hospitals are being repackaged as patient-centered, "user-friendly" and mall-like – the sort of place one "chooses" to visit in order to consume wellness services. California-based designer Wayne Ruga posits a hospital environment that would "create delight" – one that would be "fun to visit, not anxiety producing." Patients would go not to such a hospital to "get fixed," but rather to plan a program of wellness. While Ruga takes the Nightingale Ward as a model of spacious, enlightened design, he harkens back to antiquity, personally conducting tours of archeological Asklepiion sites in Greece and at Pergamon.

In Tokyo's central business district, Asklepiion's daughter Hygieia has recently had a "health plaza" named in her honor. According to Ruga's *Asclepius* newsletter, Hygieia, opened in 1993 provides a "truly seamless 'cradle-to-grave' network of services ranging from ambulatory care, acute care, state-of-the art diagnostic and testing services, health promotion activities, educational resources, and shopping" at Japan's first L.L. Bean store. The twin eighteen story-towers set atop an atrium base make Hygieia a sort of mini-World Trade Center of wellness.

But in addition to presenting itself as a "friendly place" overflowing with efficient Epcott-style beneficence, the new medical-mall-multiplex will nevertheless have to actually function as a hospital. At the design level, the medico-economic drive toward flexibility and efficiency has led to a general repudiation of megastructures and a revival of the pavilion scheme. The contemporary hospital must now respond to rapid changes as a set of linked, semi-autonomous organs, able to grow, shrink or otherwise modify *ad infinitum*. At Columbus Regional Hospital in Indiana, Robert A.M. Stern has designed pavilions formed out of simple 24 foot square modules that can accommodate a variety of layouts. Stern's pavilion scheme promises to cut operating costs 10% with a hospital designed for shape-shifting. If it were a body, it would be

constantly morphing, altering its configuration and proportions, less an architectural structure than, in Ruga's term, a "constellation of services."

Concurrent with legislative deregulation of health care and a presumed acceleration in the pace of change comes designing for obsolescence and an abdication of planning. On this shifting terrain, where the hospital is no longer a social institution but rather a quick-in, quick-out investment strategy, a kind of anti-standardization in delivery of care as well as design of facilities takes hold. The much-disparaged public sector has not remained immune to this trend. In the late 1980s, the U.S. Veterans Administration abandoned their program of standards. The two hundred year old movement toward standardized design and care, begun by Tenon and codified into its military and civilian forms by Nightingale and Olmstead has effectively been reversed.

The upside of the shredding of the current hospital system is that experimentation and improvisation will likely yield new models of design and care. After all, war, industrialization and automotive carnage have resulted in significant clinical advances. The downside is that, apart from investors, no one knows quite what to do except wait for some sort of umbrella to take shape and hope that it covers them. If the past is any indicator, there will be only so much umbrella to go around. But unlike the rain, the size and configuration of the umbrella we design will be dictated not by nature, but by social forces. Architecture is in no position to question the underlying assumptions at work here. It has been hired to perform its task in a professional manner and creative spirit. But with managed care as the ultimate "client," Louis Sullivan's axiom is reversed. The hospital's function now follows the dictates of economic form. What evolutions does this form demand?

One thing the future hospital should contain is a great deal of technology. The hospital should also become a factory for generating many pleasant sensations. Electronic monitors should substitute for costly, human support staff. The future hospital ought to have far fewer beds. With insurance companies limiting reimbursements, hospitals will move further in the direction of delivering cheaper, faster, ambulatory care. Starting with the most economically vulnerable institutions, hospitals will increasingly face wrenching choices. The public Los Angeles County-University of Southern California Medical Center (LAC-USC), recently found itself confronting a Solomonic dilemma. When the indebted county proposed closing the

obsolete hospital, public protest forced a reconsideration. Now \$1.2 billion is being spent to rebuild the center. The price paid for saving the hospital was the closing of all six of the county's satellite comprehensive health care centers and most of its community clinics – ironically just the sort of small, efficient facilities often described as models of progressive care.

With the current construction of New York Hospital-Cornell Medical Center's billion dollar facility on the East River, the hospital reinvention process has entered into the realm of the surreal. The arriving patient may not be certain whether she or he is entering the Pierre Hotel or the Museum of Modern Art – the hospital's two decorative and environmental paradigms. But the medical underpinnings of NYH-CMC's deceptively unhospital-like surface remain state-of-the-art technologies – including \$24 million worth of Em-Tech computers that promise to “watch the patients.”

NYH-CMC, while reinventing itself via public reimbursements and subsidies, has yet to demonstrate its commitment to serving indigent patients. In giving its approval to the plan, New York State forced the hospital to rewrite its admission policies so that the uninsured and underinsured would not have to pay a deposit at the door. This past March, the federal government found the hospital guilty of refusing to treat an uninsured, dying girl. When this new NYH-CMC is completed, patients lying on two-hundred plus count linen sheets on the upper floors may, on a clear day, be able gaze downriver to the ruins of Bellevue's old panoptic cross for lunatics on Roosevelt Island.

If one wishes to reweave the divided strands of medicine and wellness it may not be necessary to journey back as far as the hall for dreamers. Barcelona at the start of the twentieth century may do. Lluís Domènech i Montaner designed a thoroughly modern medical and surgical facility there infused with the therapeutic power of art – the Hospital de La Santa Creu i Sant Pau, the Holy Cross and St. Paul. Spurred by a bequest from a Catalan banker, the hospital became *modernisme's* largest project, covering 360 acres. Forty-eight distinctly different pavilions rose in a huge garden over an underground service network. The hospital was designed around the two avenues forming cross set at a 45 degree angle to the surrounding urban grid. At once rigorously medical, the hospital consciously seeks to address its patients and staff at the level of mood. At the reception area, glittering mosaic murals depict the history of the

hospital from the middle ages. Colored roof domes, skylights, and playful ceramic motifs proliferate. Everywhere there are sculptures, and the images of secular and religious healers. Domènech died before the Hospital de Sant Pau was finished, but his son completed the project and wrote of his father's method: "the material took on nobility, even if it was ordinary... if it was joined to the use of some rich material, even in small amounts, the thing acquired a character of richness, surprisingly so in view of its real price. So it was with the Hospital of Sant Pau, in which he thought that everything that could give a feeling of well-being to the sick was also a form of therapy."

Whatever models we embrace, our future hospitals will continue to mirror the social relations that give them form. And in retrospect, hospitals will tell us what we valued, revealing how we sought to care for ourselves and one another.

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