The Yale Plan of Medical Education: The Early Years

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This paper considers the early years of the Yale Plan of Medical Education, which has come to be called the Yale System. It chronicles and analyzes the incremental development of the System and considers evaluations of the plan and modifications introduced over time. Also considered are external factors which influenced design and implementation. The paper covers the period of medical education at Yale from the 1920s to the early 1950s.

“Time dissipates to shining ether the solid angularity of facts.”
—Ralph Waldo Emerson

_Essays: First Series_
1841

“Fundamental to this program is the concept that the medical student is a mature individual, is strongly motivated to learn and requires guidance and stimulation rather than compulsion or competition for relative standing in his group. Equally basic is the concept that if the student is given unusual privileges, he must assume more than usual responsibility for his education.”

—Curriculum Committee Report
1927

A good deal has been written about the Yale Plan of Medical Education (or, as it is more commonly called, the Yale System), but in recent years what has been said about it has often been muddled and somewhat confused. Most agree that the Yale System is indeed a system, in that it comprises a set of doctrines and principles which explain the working of a systemic whole, but there are others who argue that it is more a philosophy, a peculiar mind set, something intangible, like Emerson’s “shining ether,” certainly not anything based on the “solid angularity of facts.” What has happened is that over time the Yale System has come to mean different things to different people. For some students, for example, the Yale System is the primary reason why they selected Yale, while for others the Yale System is something they learned about only after having arrived here. The faculty express similar confusion. Some, finding no mention of the Yale System in the School’s Bulletin [1], state emphatically that there is no System, that it is a figment of the imagination, while others, accepting the existence of the System, either point out that it is simply not working and in need of revision, or accept it at face value and militantly declare its sanctity. Change but a bit of it, argue this latter group, and everything that makes up the medical school, student body, and faculty—indeed, Yale’s very place in the scheme of things—falls to pieces.
The above conclusions are presented as accumulated observations, and no value judgments about them are proffered. If some technical adjustments to the System are to be made, or if it is to be left as is, then it is wise to investigate the System's origins and modifications over time, if for no other reason than to have our facts right. Moreover, it is important to review the Yale System in a broader context as notable events rarely occur spontaneously, but instead are the result of a peculiar confluence of social, economic, political, and personal factors, some rational, some accidental, some emotive, and some novel.

I

The Yale System is most closely associated with Milton C. Winternitz, who became Dean in 1920 at a time when the School “faced the most disheartening prospects” [2]. When he was elected Dean, the faculty had lost some of its ablest men; the physical plant was scattered, outworn, and outmoded; the hospital facilities were inadequate for the purposes of a modern school; the students were few in number “and in many cases unsatisfactory in ability and personality”; the alumni of the University were unhelpful and hostile; the University community distinctly unsympathetic; and the school and hospital both “crippled by lack of funds.” Altogether, wrote James Angell, Yale’s President, “the outlook was as unpromising and depressing as could well be conceived” [3]. Within a few years of Winternitz’s election as Dean, however, everything was turned around. A mere listing of Winternitz’s accomplishments reveals his whole achievement. He first brought the school into close alignment with the University by organizing medical school departments as departments of the University, opening thereby the medical and graduate schools to each other’s students. Building upon the ground laid by his predecessor, George Blumer, Winternitz brought to fruition the full-time system. He also found new sources of money for buildings and facilities; designed an “elastic” curriculum which “liberated” students’ time and was adaptable to individual abilities and needs; established a Department of Psychiatry and Mental Hygiene, a School of Nursing, and institutes devoted to Human Relations, Psychobiology, and Neurology; and all the while succeeded in assembling a first-rate faculty that elevated the School to the front rank of medical institutions in the nation. How Winternitz achieved all that he did is one of the great mysteries. His utter self-confidence, dedication to excellence, ability to convince others of the importance of reform and to obtain large endowments from important foundations—all these have been cited as reasons for Yale’s emergence in the 1920s as a premier school [4]. In Angell’s words, he was a “steam-engine in pants” [5], but, howsoever described, Winternitz somehow won over the Yale administration and his own faculty and pressed on with his imaginative plans for medical education reform and academic and professional excellence.

In an endeavor to attain this excellence, Dean Winternitz focused on medical education, an issue he addressed in each of his annual reports to the President. The educational programs in the nation’s medical schools certainly were in need of some revision. As Vernon Lippard has written, some schools taught medicine by “grammar school standards.” There were daily recitations based on textbook assignments; lecture notes to be memorized and regurgitated during weekly examinations; laboratory experiments performed from manuals (“with the principal goal a neat report rather than an understanding of the physiological mechanism they were expected to demonstrate”); and special initiative and independence of mind discouraged by a rigid, plethoric schedule [6].
Winternitz was aware from the start that medical education was organic and mutable and believed that if Yale were to take its place in the front ranks of schools it would have to be known for "some phase of service to science and humanity" which would give the school "individuality," a word which for Winternitz became a credo. The full-time system had been a step toward individuality, but there would have to be other steps if the "eyes of medical educators" were to remain on Yale. One way to keep such attention focused was to develop "pedagogic experiments" which, if judiciously implemented, would have the twofold benefit of aiding medical education and of giving "character" to Yale [7].

There were many such pedagogic experiments in the 1920s, many (but not all) of which became components of the Yale System. One "radical" change was to reverse the order of clinic experiences in the third and fourth years. Prior to 1921, third-year students were assigned to the outpatient clinic "where [according to Winternitz] they obtained a fleeting glance at a multitude of individuals in many stages of health and disease," while fourth-year students were admitted to the wards "to study individually and at length diseases in bedridden patients." Winternitz believed the order wrong. Too much time was being spent in the hospital where students studied only the end stage of disease. There was much more to be learned, he wrote. As every family practitioner knew, success in patient care, diagnosis, prognosis, and therapy was dependent upon familiarity with the individual, his heritage, environment, and reaction to abnormal stimuli. Too much of the curriculum, he concluded, was entirely absorbed with methods of recognizing and treating "outspoken disease." With the exception of infectious disease, students had little training in prevention. The newly organized ambulatory clinic of the School, which to Winternitz was to be a "health clinic" and not merely a "disease clinic," was to offer students an opportunity to devote their creative energies to "correlating their knowledge of health and disease" learning not only diagnosis, prognosis, and therapy, but also prevention [8].

As the next experiment, Winternitz turned to the "overcrowded" curriculum. Too much time was being spent on "deadening routine" and in required courses. Students were being exposed to the mere bits and pieces of the new science and, in many cases, were thinking of specializing too early in their careers. A report by Professor F.P. Underhill had already addressed this issue. The curriculum was indeed "overcrowded," he wrote:

[The student] is the defenseless recipient of an overwhelming mass of facts which he may or may not be able to correlate... Scientific progress during the last twenty-five years has been so great that each coordinate science in medicine has widely extended its borders... [1]n the enthusiasm of teaching his own subject there is the decided tendency to over-teach,—to expect the student to become in turn a finished anatomist, physiologist, pathologist, etc. This is... a fundamental error.

Underhill believed the remedy for the overcrowded curriculum was "judicious pruning" of all the subjects in the School. With less time for individual courses, Underhill believed instruction would be improved,

for with less time at his disposal the instructor will naturally emphasize fundamental principles. Details will be of less significance, and it is hoped that such a procedure will result in better training of the student by making him more capable of being self-sufficient and independent... In other words, as one
of the members of this curriculum committee has aptly said, we hope “to teach
the student less, but learn him more” [9].

Winternitz accepted Underhill’s conclusion and proceeded to reduce the number of
hours, in his words, to offer students the opportunity to exercise their “individuality.”
A total of 1,208 hours, one full year’s work, was “salvaged” from the required courses,
permitting students to select from a wide variety of elective courses with advice from a
committee of the faculty. Students would continue to receive a “well-grounded training
in the fundamental principles” of medicine, but would now be able “to elect courses for
either broader general training or more extensive experience in one or another field in
accord with their [ultimate objectives in medicine]” [10].

An additional component of the Yale System is the thesis, an important feature of
education at Yale since the early nineteenth century. With more free time and a
reduction of required courses, Winternitz believed that there would now be more
opportunity for independent research and a truly proper thesis. In the mid-1920s,
however, Winternitz was a realist regarding the thesis. He did not expect that every
thesis would be of “paramount importance,” but, by placing the student “in the proper
atmosphere, providing opportunity, and by placing a premium on research,” he
believed that more theses would be worthy of publication and an increasing number of
students would become interested in purely research careers [11].

Yet another development, addressed first in 1924 and implemented in 1925,
considered the issue of student independence and maturity and is perhaps the
desideratum of the Yale System as we know it today. Medical students, wrote
Winternitz, were selected with care, but were of wide variety, some advancing more
quickly than others. While some were bogged down in one term course or other, other
students were ready for electives and independent research. Winternitz made the
analogy to the Graduate School where students worked at their own speed, progressed
from course to course, and then, when they felt prepared, and their professors believed
them ready, sat for qualifying examinations, which, after having been passed,
permitted them then to proceed with their independent research leading to the doctoral
dissertation and the Ph.D. degree. Winternitz’s new plan for the medical school was to
abolish the policy whereby students progressed through the school on a course-
to-course, year-to-year basis, as a class. Now students were to select the sequence of
their studies and advance from one year to the next “as a matter of individual choice
and ability.” And just as there were qualifying examinations and the doctoral
dissertation for graduate students, there would be in the medical school “some check”
on the medical students’ accomplishments. This “check” would take the form of
“group examinations” (by which he means comprehensive or qualifying examinations)
and the writing of a thesis, but there would no longer be examinations in either the
medical school’s required or elective courses [12].

II

By 1926, the essential components of the Yale System were in place. Much interest
in the “Yale Plan,” as it was called, appeared in print. Charles Stockard of Cornell, for
example, writing in the Journal of the American Medical Association, described the
Plan as a “highly promising and stimulating occurrence.” He focused especially on the
independence of the student afforded by the new Plan, the fact that the student was no
longer a member of a class and was free to attend as much or as little of a subject as his
interest dictated. It was of singular importance to American medical education, he
wrote, that Yale should have put itself on a “truly university basis” in its function as well as in its organization.

The university method [he wrote] is certainly one that develops individuality and originality in the student, and at present it is the only system that fully allows a student to become interested in certain phases of a subject and to be free to develop and follow his interest in those directions. . . . The country at large owes its thanks to the faculty of the Yale medical school for having taken a definite step in what is probably a very wise direction. It is at least gratifying that one school should have asserted its individuality and independence by introducing a really different system, rather than simply following through the stagnant style of addition and subtraction, as applied to the several courses in the medical college [13].

Stockard acknowledged that some would say that the Plan “smacked of radicalism” and that others would imagine it “the adoption of a loose, unsystematic, indefinite system which could never be substituted for the rigid arrangements now generally followed.” But for those who have “worked and studied both in the college and under the medical curriculum drill as well as in the true university system, there will appear nothing new or dangerous in this undertaking,” he wrote [14].

Stockard also mentioned, almost in passing, an additional feature of the Yale plan, the examination, to which we now turn. Stockard wrote that examinations at Yale were given at regular or irregular intervals. Students having been previously registered in a particular course were to present themselves for these examinations “so that they may qualify in the subject.” Examinations, he felt, were important as it was:

necessary [in all universities] to have some type or method of examination in order to determine whether a student has actually succeeded in mastering a sufficient knowledge of a given subject; in other words, he must qualify on what he has undertaken. The world [he concluded] requires this much of us all [15].

What about the examination? How should students be evaluated? As early as 1922, the Curriculum Committee took up the issue of evaluation and recommended no change in the “time honored principle of leaving to the judgment of each medical school section or department to develop the form and type of examination given to students.” Nonetheless, they set forth one major principle and made one major recommendation. The major principle was that students were more important than the exam; that is, “an attempt should be made to evaluate the students’ abilities rather than to endeavor to evaluate [the course work mastered].” The major revision was that instead of mid-term examinations, examinations were to be given only at the conclusion of the year [16]. Both were important steps toward the radical policy, which ultimately emerged in the 1926–1927 academic year, that there be no mid-terms or final examinations, or even quizzes, but instead a comprehensive examinations, or, as Winternitz first referred to them, “group” or “qualifying” examinations, which would be based on the tripos examinations then current at Oxford and Cambridge [17].

Winternitz took the position in the early 1920s that Yale medical students were mature, self-sufficient graduate students who were not to be led by the hand or regimented. They proceeded at their own speed, and, when ready, would take the comprehensive examinations to qualify for admission into the clinical years. Students were to learn that true mastery of a subject came only from reflection, total immersion, and independent study preparatory to the comprehensive examination. When they sat
for their qualifying examination, he believed, all the many discrete and desultory bits of information would come together as a coherent whole. The qualifying examination, then, was to measure not just student ability, not just mastery of a subject, but the ability of a student to "correlate knowledge."

The qualifying examinations were first given in March 1927. By the time the examinations were evaluated in December 1929, seven examinations had been held. The examinations were not easy, nor were they easy to prepare or grade. They consisted of four parts. Part I covered anatomy, physiology, physical chemistry, pathology, bacteriology, and pharmacology and consisted of 74 to 102 short-answer questions. Part II consisted of 18 long-answer questions, three under each of the six subjects, and students were required to answer two from each set of three questions. Part III was an essay, but appeared in only four of the seven exams, as the faculty deemed it "too difficult to rate" and substituted instead for the fifth exam a practical. The practical lasted for only a single exam. It was easier to grade than the essay, but unwieldy, as over 50 students had to be rated at one time. Part IV of the exam was an oral, which also proved to be difficult. Members of the Board of Permanent Officers (BPO) of the medical school, selected from the clinical departments, including Public Health, served on the examining board. None of those serving were to have the students' grades for the written parts of the exam at the time they administered the orals. Each board member asked questions and independently rated the student. To save faculty time, when the number of students sitting for the oral was large, only the bottom half of the class was required to sit for the oral. And, as the Board was not to know who had or who had not passed the written, "a few from the upper half of the class [were to be] called in as well" [18].

III

As soon as the Yale System was adopted, an evaluation committee was established to monitor its progress. The committee, chaired by Dr. Harold Burr, first addressed the issue of time spent in teaching. Burr noted that the newly "liberalized" curriculum of the first two years and the removal of course exams and quizzes had meant that faculty in each department were spending more time with students in order to gain greater personal knowledge of them. Many believed the increase in "personal contact" to be "an excellent substitute for routine classroom work," but in those courses where there was no increased personal contact, the new curriculum had had "little or no effect" [19].

The second item evaluated was the time spent on faculty research. Dr. Burr had found that the general increase in student contact throughout the first two years had resulted in less time being spent by the faculty on their own research. The liberalization of the curriculum had meant "frequent and informal conferences with individual students, or small groups of students, outside of scheduled routine hours," an asset for students, but troubling for the faculty as it "militated" against constructive research and contributed manifestly to piecemeal or what some called "sputtering research" [20].

The committee evaluated the effect of the Plan on the faculty and staff. Some departments had been able to add personnel, which helped make the adjustment to the new program successful. But the majority of departments reported that they needed additional staff to carry out adequately the "spirit" of the new program. Burr concluded that the "heart of the entire experiment" lay in expanding the faculty, and,
as he later wrote, increasing departmental budgets as well. The committee had found that, as more students were interested in individual research, each department had been forced to request additional funds for materials and supplies. If additional monies could be released from the School to the departments for these purposes, Burr believed that "the constructive [research] work of the School would be enlarged" [21].

The Committee wanted to know how the new program had affected the relationship between teachers and students. Burr wrote that:

The release from routine quizzes, grades and examinations has removed an element of fear from those relationships to the benefit of both teacher and student. However, the very absence of these checks has made it imperative that the teacher familiarize himself much more completely with the individual accomplishments of each student.

This had been found to be time-consuming, wrote Burr, but the results were "eminently worthwhile" [22].

Had the classroom work improved? Burr found that it was the unanimous opinion that those students who had taken advantage of their opportunities had showed a marked improvement in the quality of their work, "and an improved attitude toward it." However, as their review of the curriculum had not been based on "a true statistical evaluation," comparisons were difficult, he added. Nonetheless, "there seem[ed] to be a very general opinion that the average and poor students [suffered] because of the lack of disciplinary procedures." Burr's conclusion was inescapable: "[T]he quality of [students'] work was probably not as good as formerly" [23].

Unlike the required courses, however, the quality of students' work in the electives had "noticeably improved." In several instances, Burr wrote, "seminars and investigative activities [were] the equal of or better than those found amongst beginning graduate students."

Were the students doing more and better research? Burr reported that some departments had seen no increase in research, while others noticed a steadily growing number of students developing research problems. In still other instances, departments reported not an increase in the number of students, but an increase in the amount of time students had been spending in research. The committee wondered if the quality of the research had improved and found that, while difficult to measure after only a few years, there had been "a very general opinion that the increased freedom of the new program had reacted favorably upon the quality of the student research activities" [24].

Burr also had found that there had been "a considerable divergence of opinion" abroad in the School regarding the qualifying examination. Some of the preclinical staff had believed the fundamental idea behind the qualifying examination "sound and good," while others had believed it too early to evaluate, that more experience would be needed. Burr found yet a third group who believed that the substitution of the qualifying examination for course examinations had been of "doubtful value," so much so that "the quality of much of the classroom work [had] deteriorated." However, a fourth group, representative of the preclinical and clinical faculty, thought, in constrast, that "the extramural character" of the examination had proved to be of "inestimable value" [25].

Burr included in his discussion of the exam a report from another subcommittee, which had been given the charge to review the year-to-year experience with the
examination. This subcommittee had found that, between March 1927 and June 1929, 160 students had sat for the qualifying exams. One hundred and twenty of the 160, or 75 percent, passed the exam the first time and 40 failed. Of the 40 failing, 11 passed the second time around. Of the 29 remaining, 12 were "eliminated" from the School (five failed and seven withdrew), and 17 ultimately repeated the courses a second time. The summary data revealed, then, that 131 (or 81 percent) of the class passed into the third year, whereas 12 (7.5 percent), between March 1927 and June 1929, had left the school [26].

Burr concluded with a general summary of the criticism regarding the exam. It was generally felt, he wrote, that the qualifying examination had not been "sufficiently searching in the fundamentals of the six preclinical subjects." Examinations of this sort, he added, had been difficult to prepare and required "very great thought and care." A second summary point considered the philosophy underlying the qualifying examination. One of the prime objectives of the new program had been to develop the "correlating capacities" of the student which was to have the effect of breaking down "the artificial barriers between the preclinical subjects." This, however, had not happened, Burr wrote, nor had these objectives been sufficiently stressed by the faculty. As each department submitted their own questions, the "form and character of the examination" tended to emphasize not the correlation of knowledge, but the "independence of the preclinical fields," a distinctly negative feature and one contrary to the "spirit" of the Yale Plan [27].

Summarizing the full report, Burr concluded bluntly that the new educational program was successful, but only "within certain limits." The good students had been found to "profit considerably" whereas the poor students "suffered." The weaker students, he believed, would probably continue to fall behind unless additional staff were hired as instructors. Student research had increased in both quantity and quality, but there were concomitant costs; for example, faculty complained that their research productivity decreased as the student demand for more attention had increased. And, "though fundamentally sound," the qualifying examination had been "far from successful" [28].

Burr then turned to additional items which are indicative of the lack of unanimity within the committee (and the School itself). He presented, for the record only, a list of suggestions, three of which considered the qualifying examination. For example, listed were the following: return to the former course examinations, in addition to a comprehensive examination written by the preclinical faculty (in consultation with the clinical faculty); substitution of either the exam of the Connecticut State Board, or the examinations of the National Board of Examiners, for those of the School; and establishment of an "extramural examination committee" composed of preclinical faculty from other institutions who would sit with an "advisory board" of the School to write and administer the exam [29].

The final paragraph addressed an issue of concern both to the School and the failing students. Those students who each year failed the examination had been found "to labor under an unjust hardship" in that, having failed, they had little to show for two or three years' work. Burr recommended that the Dean get involved by writing informative letters on behalf of the failing students. For example, the Dean's letter would describe the Yale Plan, state that the student had taken the preclinical courses offered by the School, include the grades, and offer a subjective evaluation of the students' abilities. The recommendation was not approved, and was modified to have individual
preclinical faculty write their own letters, which would be in the form of a student evaluation. Failing the all-important qualifying examination meant that the student would be forced to seek admission to another school, making up those subjects unsuccessfully completed at Yale, or to enter another field of endeavor altogether [30].

The qualifying examination, then, was difficult to prepare, administer, and grade, and, although the majority of students passed, those who failed were left in the cold after two years of academic work. Many were dissatisfied with the exam, but an equal number held firm, believing in the graduate school philosophy which Winternitz had superimposed upon the School and in the integrative nature of the exam, which had been designed to show the continuity between the preclinical and clinical years.

Eventually, in the early 1930s, a compromise was reached, having been effected primarily as a result of the introduction of the examination of the National Board, whose two-part exam was believed to be a godsend [31]. It was fair, consistent with the comprehensive nature of Yale's own qualifying exam, integrative with Yale philosophy, and had the added virtue of being written and administered by someone other than the Yale faculty. The compromise was set forth and approved by the BPO in 1931 [32], reaffirmed in 1933 [33], and remained in effect until early 1937. Its principal features were that (1) Parts I and II of the National Boards replace both the School's qualifying and final examinations and (2) the Department of Clinical Medicine develop a practical (qualifying) examination, passage of which was mandatory before permission would be given to students to take Part I of the National Boards.

IV

Despite the anomalous conclusions reached by the evaluation committee, no changes in the Yale Plan were proposed during Winternitz's tenure as Dean. What had evolved over the course of a number of years, and to which changes and modifications had been made, came to be discussed, written about, and promoted by Winternitz in characteristic lapidary fashion. In 1932, for example, Winternitz published two essays, one for the Rockefeller Foundation [34] and one for the Yale Alumni Weekly [35], both of which were widely circulated and presented before various audiences at Yale and elsewhere.

Both summarized the progress of medical education at Yale and both emphasized two of the achievements and principles of which Winternitz had been justly proud, the Institute of Human Relations and the Yale Plan. In each paper, Winternitz outlined Yale's distinctive and unique achievements. He referred to the "liberalize[d] curriculum," the comprehensive examination, the fact that medical students, after two years, could opt for the Ph.D. degree or that graduate students, after the same period of time, could choose to seek the M.D. degree, and how the students were selected "on the basis of maturity of judgment, stability of character, and general initiative, as well as scholastic achievement" [36]. The curriculum, he wrote, was "elastic." The student "studied subjects"; he did not "take courses," he wrote. Students, once they passed the "general examination" were then ready for clinical study, where "attention center[ed] upon the natural history of disease." And the "correlation of subjects" was kept constantly in mind, a concept fostered in courses and seminars given conjointly by faculty representing different fields and effected through study groups, conferences, and informal associations between faculty members, "which tend[ed] to keep the latter aware of the objectives of medical education as a whole" [37].
The philosophy of the plan appeared in both papers, expressed as follows:

Regimentation is avoided. . . . Responsibilities all too often assumed by teachers are thrown upon the student. If [the student] is interested and wants to work, he has the fullest opportunities for study and guidance; if he is not himself interested, he will find no one to pull him along. This freedom is not desired by the immature student, or by the one whose primary interest is in the acquisition of a degree and not in the subject matter; but it is an advantage to the independent, thinking student generally interested in medicine and anxious to be rid of those pedagogical procedures and routines which have no bearing upon the acquisition of knowledge [38].

In each paper also appeared Winternitz’s commentary regarding the Institute of Human Relations (IHR), his boldest scheme and most disappointing failure [39]. Founded in 1929, IHR had been designed to be the “agency for the stimulation of research in biological and sociological fields and for the discovery of areas of common interest in which cooperative endeavor might be possible” [40]. The philosophy underlying IHR was that “medicine was a socially significant science,” and was not a “self-sufficient entity, set apart by man and God as an independent realm into which only a chosen few may enter.” Instead, medicine could be “enriched and significant to the extent that it [fitted] into the scheme of the social organism as a whole and contributed to the general well-being of society.” Winternitz’s fundamental belief was that medical education would have to be “adjusted to the [evolving] conditions and concepts of life so that the prospective physician [would] not be buried under an avalanche of specific facts or in other ways rendered incompetent to utilize his training in a socially justifiable way” [41].

Winternitz turned away from reductionist medical science and built up a system based upon the principles of social medicine. Medical students were to be exposed not only to the preclinical sciences, but as well to the social and behavioral sciences and to law and theology. Medical subjects were to be correlated, and the Yale Plan was to be an extension of the principles underlying IHR in the same way that IHR found expression in the Yale Plan. Each unified, resonated, and reinforced the other.

Such ideas regarding IHR as Winternitz set forth in the late 1920s and early 1930s began to sound diffuse, excessively idealistic, and anachronistic in the light of the rapidly developing scientific and technological imperatives of modern biomedical science. Great achievements were being made at Yale in the basic sciences, in physiology, pharmacology, endocrinology, and metabolism, and in the clinical disciplines as well. It was these subjects that captured the interest of the young medical students and the newer faculty of the School and which made Winternitz’s eloquent statements about social science, prevention, clinical sociology, social medicine, and the need to resurrect the family physician (“who understood the patient as a human being”) sound antiquated, unscientific, distinctly pre-Flexnerian.

Although there were many reasons leading to the decision in 1934 by the BPO not to reappoint Winternitz for a third term, one may offer the contributing factor that Winternitz had simply misjudged the impact, interest, and importance of the new sciences on the medical school. Faculty soon became too busy to consider collaborative schemes, such as Winternitz hoped would be a common occurrence in IHR, or to devote precious time necessary to assure the fundamental success of the Yale Plan of medical education.
V

By early 1937, two years after Winternitz had left the deanship, replaced by Dr. Stanhope Bayne-Jones, a new Committee on Examinations presented a report which further modified the Yale System [42]. The committee was chaired by Dr. John P. Peters, Professor of Medicine, one of the bright new stars of the faculty. Peters began by relating the consensus of the Committee that the "principle" of graduate school education at the School should be maintained, which meant in part, he said, that specific course examinations were still considered "undesirable." But the next sentence indicated that erosion had already set in, for Peters then said that: "The fact that we maintain the principle of a graduate school here indicates a point of view rather than dictates rigorous rules for departmental guidance" [43].

The major portions of Peters' comments were reserved for an assault on the National Board exams. After reviewing the data, the Peters committee concluded that the National Boards (1) "served no useful function for eliminating or promoting students"; (2) presented difficulties in scheduling; and (3) were "a disturbing element to second year students since the examination period is prolonged unduly." Peters also said that the National Boards contributed nothing to the growth and development of Yale and "that a School such as Yale, wishing to develop a personality of its own," could not benefit from an extramural examination "which did not cover the content of courses given." C.N.H. Long agreed, pointing out that the National Boards were inadequate for the simple reason that they had been designed to be applicable to all schools throughout the country [44].

Dean Bayne-Jones sided with the Peters Committee. Between 1932 and 1935, he said, 155 students had taken the National Board exams. Of the 155, 151 had taken Part I and 99.4 percent had passed. Bayne-Jones wondered, as did others, what sort of an evaluation mechanism an exam could be with such an abnormally high rate of passing? Drs. Burr, Samuel Harvey, and former Dean Winternitz dissented, believing that the recommendation to abandon the National Boards was "a step backward to an older and discarded procedure," but their comments were overruled in favor of the motion which BPO approved; to wit, that the School no longer require that students take either parts of the National Boards [45].

The new procedure called for the appointment of a Committee on Examination, consisting of members recommended by the Committees on Preclinical Subjects and Clinical Subjects, respectively. The new committee was to be empowered to prepare, conduct, and grade the comprehensive written examination for students who had completed the normal course of the first two years. At the discretion of the committee, there were to be supplementary oral exams (I assume for those students who received borderline grades on the written exam). Students who failed to qualify on the first try would be permitted to present themselves for a second attempt; "but no student twice failing to qualify [would] be permitted to continue in the School as a candidate for the M.D. degree." When students completed the clinical years, the Committee on Clinical Subjects was empowered to establish a final comprehensive examination which would serve to replace Part II of the National Board and the School's own oral examination [46].

Bayne-Jones, who served as consultant to the National Board, but who nevertheless strongly urged dropping the National Board requirement for Yale, summarized the action of BPO in his 1937 annual report. He reiterated the criticism that the exams had become "cumbersome," duplicative, disturbing to work in courses, and not an accurate
means to sort out poor students. More important, he wrote, Part I of the National Board exam had made too manifest the already sharp division between the preclinical and clinical years. Bayne-Jones referred to this lack of continuity in the course, "not so much as a personal separation as a cleavage of interests which tended to disintegrate the homogeneity of scientific medical training" [47]. Under the new system, the exam would be written by members of both the preclinical and clinical faculty, assuring for a more integrative and clinically relevant examination.

By 1939, Bayne-Jones had found that nothing had changed. Altered conditions had led to an increase in the number of and demand for newer courses, and everything was again called into question, including the School's objectives, the content and scheduling of required and elective courses, the qualifying exam, and the educational methods and procedures of the School, including the quality of teaching [48].

The feeling of many was that the School had lost "some of its liberal spirit as an agency for advanced instruction." In the words of one faculty member, "Elaborate schemes, techniques, rules and regulations had been substituted for vital teaching." Such expressions of dissatisfaction were expected and Bayne-Jones had himself participated in many faculty debates which revealed the not inconsiderable differences of opinion. He wrote in 1939:

Some members of the faculty leave much to the initiative of the student, others make use of frequent quizzes, examinations, and rather close supervision. The same differences of desire exist among the students. Some wish to have a very large degree of freedom in their work; others request assignments and guidance. [Also, a] number of physicians outside the School, and a number of students, complain that the instruction offered is not sufficiently practical and that too much attention is given to research [49].

Bayne-Jones presented his own impression of the state of the School. The School, he said, continued to maintain the "high ideal of a graduate institution" and its "superiority over other schools in its educational program and methods." The students admittedly had "a large degree of freedom," but the best students "liked the system immensely because it [gave] them scope for their talents." Even the "less able students," he wrote, "saw the value of the plan." Given that the graduate was healthy, well-balanced, and of good personality and character, the final product was "eminently satisfactory," as such graduates secured good hospital opportunities and did good work. The "educational philosophy" and plan of the School produced "resourceful students," he added. Yale graduates were "practical" not because of practical courses taken in the School, but because of "the cultivation of the intellectual capacity to distinguish means from ends." The students learned "to locate a problem, resolve it into its parts and find a relevant solution." This applied "to the problems presented by patients suffering with disease in the same way as it applied to problems in physical science and to situations in life" [50].

Despite Bayne-Jones's strong sentiments in favor of the Yale Plan, he felt it necessary to create in 1939 a special committee with "broad powers" to review all aspects of the curriculum. Chaired by Dr. Hebbel Hoff, the committee presented its interim report in 1940. No conclusions were presented, but after numerous meetings and the review of much information the report confirmed the view "that the curriculum [was] in need of drastic revision" [51].

The Hoff committee had found that there had been an "enormous encroachment" of regular course work upon available time. In 1926–1927, for example, the schedule
called for 3,470 hours of required course work out of an available 5,808. In 1938–1939, the total hours for required courses had risen to 4,103. Also, as many electives had “the force of required courses,” the schedule in reality included 5,020 hours. The committee also concluded, in favor of the Yale philosophy, that quizzes and course examinations, which were still found to be held in some departments, “be reduced in influence on student grades in order to revive the graduate school attitude characteristic of the School” [52].

Additional recommendations were cited in the preliminary report. Many of the courses could be improved, they felt. Also, as the work of the first year, or first two years, had been found to be too unrelated and uncoordinated to the clinical years, “something would have to be done to integrate the two phases of education.” And medical school teaching and the teaching of interns also needed greater “integration” as the effect of specialty boards upon the education of medical students had become increasingly significant [53].

The interim committee also addressed the issue of the scholastic performance and the qualifying examination. Members of the Committee on Preclinical Subjects and of the Committee on the Qualifying Examination had expressed their concern and anxiety to the Hoff committee about the “general level of ability” of the first-, second-, and third-year classes, whom they had found did “not contain as many brilliant students as some previous classes.” Bayne-Jones, however, was not in the least exercised. Review the qualifying exams by all means, he wrote, but, as his personal predilection was always to give “considerable weight to character, attitude and personality,” he regarded the students, no matter what their scores, to be “highly satisfactory and of good quality.” The data, however, did not support the Dean, for although all had passed the exam taken at the end of the fourth year, four had failed the preclinical exam and an additional student “withdrew on advice.” Nonetheless, Bayne-Jones concluded that the School had “selected its students wisely” [54].

VI

In 1940, Bayne-Jones resigned his position as Dean to resume his bacteriological research and become Director of the Board of Scientific Advisors of the Jane Coffin Childs Memorial Fund and was replaced as Dean by Francis Gilman Blake, concurrently chairman of the Department of Medicine. Blake received the final report of the Committee on Program and Policy. The Hoff committee reiterated its earlier conclusions, submitted in its 1939 interim report. They recommended no change in the School’s qualifying examination, strongly favored the M.D. thesis as a “valuable educational procedure,” and worried further about the great increase of required hours at the expense of electives and that the problem of the non-integration of the preclinical with the clinical years persisted.

The BPO addressed the issue of required and elective courses by “transferring” some required courses to the status of electives, and reaffirmed its commitment to the “liberalized education program,” the Yale Plan. Blake added in his 1941 annual report his own reaffirmation of the Plan. Despite the fact that “the underlying philosophy and methodology of the program [had] been unfortunately, though perhaps unwittingly, permitted to lapse somewhat,” Blake nevertheless believed firmly in the principal elements, the main one of which was

the too often overlooked fact that the medical student [was] an adult already embarked upon his life’s work and the obvious corollary that he must learn both
to pilot his own boat and assure to a large extent the responsibility for acquiring that content of knowledge which is necessary for him in charting his future professional course, whether it be that of the general practitioner, the specialist, or the worker in the field of basic sciences [55].

Blake was especially influenced in his reaffirmation of the Yale Plan by a paper considering the objectives of a medical education published by his colleague Samuel Harvey. Harvey, chairman of Yale's Department of Surgery since 1924, was a loyal and respected citizen of the School and a man who was absolutely convinced in both the philosophy and efficacy of the Yale Plan [56]. Harvey in 1941 had written that the curriculum influenced the development of the qualities prerequisite to medical practice. These qualities were integrity, intelligence, capacity for work, judgment, and skill in the use of the scientific method. None of these, he wrote, could be taught by the "traditional didactic and obligatory methods," but instead must be learned by students from example and by personal experience gained in the laboratory and clinic. Bring the student into

working contact with a senior person of integrity, of high intelligence, of great capacity for initiating and sustaining work, of sound judgment, and one constantly employing the scientific method in the solution of problems, and a sound approach will have been made toward the objectives which the school of medicine should have in view [57].

Harvey was especially opposed to "disciplines," for behind this, he wrote, lay the concept

that a timed, enforced performance [would] bring a student into habits of behavior that [would] persist throughout life . . . [It was from this that had] arisen the educational method of enforced attendance at exercises, the controlled systematic coverage of material, the frequent checking by oral and written examinations, and the evaluation, in mathematical terms carried to absurd degrees, of the work done [58].

Such a system Harvey likened to a link of sausage. "The student puts his tuition in a slot, jumps in the hopper, and comes out the spout of a machine, a link of sausage even down to the cellophane wrapping of an appropriate degree," he wrote. This method may be effective,

but that the effect is beneficial in respect to the continuing quality of work which the ideal physician should do is another thing, for work so done by rote, and so checked, destroys initiative and makes by these associations intellectual work disagreeable. The student becomes dependent upon a continuing obligatory supervision which will be conspicuously absent in his future professional life [59].

Harvey, a clinician, also believed that his viewpoint was equally pertinent to the basic sciences. As Underhill's committee had concluded in 1922, it was impossible to make an anatomist, physiologist, pharmacologist, biological chemist, or pathologist out of the student in only two years. The student, however, could

become sufficiently familiar with such fields of study so that a content of knowledge [would] be familiar for reference in the future, and above all [the
student could] acquire an insight into the methods of approach to the solution of problems in these fields [60].

Such learning Harvey believed could only be obtained "by direct experience in the laboratories, by literally handling the problem and not by lecture and demonstration." The student should be led to the literature, which he learns to use by himself, "rather than by having it eructated by the teacher, whose ruminative assistance will not be available for him in his future life" [61].

Harvey addressed the next issue in the form of a colloquy. Would the student, if left to his own initiative, study independently? His answer was that this was first and foremost a question of student responsibility.

The faculty [he wrote] provides adequate opportunities, sympathetically advises, and outlines the paths along which the student must go, but [the student] does the walking. It is [not] the function of the faculty to provide him with transportation. . . . It is to the student's interest primarily, rather than that of the teacher, that he obtain an adequate medical education. . . . [The student] should be disillusioned if he supposes that by a deposit of a fee he can transfer the weight of the burden to the faculty [62].

Harvey also considered the role of evaluation. Examinations were important, he wrote, but "[i]f the purpose of [an exam was] disciplinary and direct control of the students' activities [then there was] no place for such [at Yale]." A student, he wrote, would not have an "examining board" to govern his activities once he graduated. An examination, if properly conceived, however, would be "an adjunct of value." The student would benefit considerably if he had "the experience of assembling and correlating his knowledge and putting it down on paper." To achieve this goal, the exam could only be of a "comprehensive character" and not be merely "factual queries. . . . [T]he important thing [was] not the ascertaining of a student's absolute or relative standing, but rather the subjecting of him to a valuable educational experience" [63], he wrote.

Education, he concluded, and medical education in particular, was "a continuing process of growth which [did] not cease with the obtaining of a degree."

It is [instead] a sensitive process, for the most part autocatalytic, which responds favorably to a proper environment. [And] the most important objective of medical education is to see that such growth remains a continuing process throughout the future professional life of the student [64].

In a later section of his paper, Harvey expanded on his concept of the examination. It should be "comprehensive" in order "to enforce the correlative and systematic review of [courses and fields of experience] as an educational experience." The exam "should be given without reference to the teaching, and the teaching should be carried out without reference to the examination." Teaching, he wrote, should be directed at providing "an educational experience [and] not at preparing a student for an examination." He added that the

examination should be likewise directed primarily at being an educational experience and not for the purpose of passing or failing students. If both teaching and examining are so conceived there will be no serious lack of
correlation, and the detection of superior or inferior students will be only incidental to the process [65].

Harvey favored the written examination, using broad questions requiring "integrative correlation" rather than factual memory, as such an exam would be "sufficient to innervate the educational objective." The exam would have to be pieced together with great care by a committee of the school. But the fundamental principle must not be forgotten; to wit, that the objective of the examination was not to discover inadequate or exceptional students, but instead to enforce the correlative and systematic review of subjects and to enhance the educational objectives [66].

VII

One year later, the exigencies of war made moot a good deal of the real and imagined concern regarding the Yale Plan and the curriculum. The students continued to take the qualifying examinations between 1939 and 1941 and the results appeared in the BPO minutes. In 1941, for example, 53 students took the qualifying exam after the second year and 48 passed and five failed. Four of the five were permitted to take an oral exam, but all failed. The failure and withdrawal rate appeared to remain constant throughout the 1930s for the qualifying exam, whereas for Part I of the National Boards, in effect from 1932 to 1937, the failure rate had been insignificant [67].

The war years greatly affected the School. By 1942, 89 faculty had left the School for military service, ten of whom were full-time, and an additional 47 of the hospital staff had received commissions [68]. The School initiated an accelerated three-year program, reduced clinical year electives, and waived the M.D. thesis as a requirement for graduation [69]. The School also adopted a more "liberal attitude" regarding the admission of students applying after only three years of college work and increased the class size to sixty [70].

In June 1942, yet another major revision was introduced. Dean Blake and others expressed grave concern about how much time students were spending preparing for their qualifying examinations. The School wanted in some way to reduce the pressure of the exams in order to be able to teach more in the now accelerated preclinical and clinical years, and to free the remaining faculty from the major administrative responsibility of preparing the qualifying examinations. The recommendation was made and approved that the School now abandon the qualifying exams and return to the two-part examinations of the National Board. The BPO also approved a second motion: "That the faculty reserves the right to examine further those students whose passing grades on [the National Board exams were] below a mark determined by the Committee on technical and clinical subjects" [71].

With the reintroduction of the National Boards, the number of failing students during the war years decreased. In 1943, for example, only two students had failed, both of whom were permitted to retake the exam a year later [72].

By 1944, the BPO began to consider future educational policy, to be implemented when the war concluded and things returned to normal. In so doing, BPO once again reviewed the Yale Plan and found that there was much support for all its elements, including a restoration of the requirement that all students submit an M.D. thesis. In July of the year they voted:

To reaffirm the policy that the School of Medicine recognize that medical students are graduate students by: (1) Setting high standards of admission; (2)
providing a curriculum of required work and a maximum of opportunity for the
development of individual interests and talents; and (3) requiring completion of
a thesis before the M.D. degree is conferred [73].

At the war’s end, the Yale Plan was again addressed, this time by yet another Dean,
C.N.H. Long, who succeeded Dr. Blake in 1947. In Dean Long’s first annual report he
reaffirmed the School’s commitment to the “Yale System.” He reiterated its essential
features, listed here adjacent to those features of the Yale Plan set forth in 1927 by Dr.
Raymond Hussey of the Curriculum Committee. Long’s list included:

1. A minimum of required course work;
2. No examinations in courses;
3. Ample opportunities for, and a wide selection of, elective courses;
4. The opportunity to spend six years in the School instead of the conventional
four, without extra tuition fees;
5. The provision of fellowships which enable the abler students to pursue special
studies either at Yale or elsewhere;
6. The encouragement of an interest in research by requiring an original
dissertation; and that,
7. Since medical students are adults, no attempt is made to enforce attendance
either at classes or clinics or to exercise the kind of general supervision of their
activities to which they may have been accustomed elsewhere [74].

The essential features listed in 1927 had been:

1. The elimination of the traditional class system which encouraged rigidity in
plan of study, as well as in progression in subjects for the student;
2. The elimination of examinations given in courses at the conclusion of a given
period which in our opinion discourages the proper type of study;
3. The granting of greater freedom to students in arranging the sequence in
which courses are taken;
4. The placing of greater responsibility upon the students for their own educa-
tion;
5. Provision to permit students to advance at a rate dependent upon their ability;
and
6. An attempt to make courses available to care for a variety of interests [75].

VIII

One can conclude that the features of the Yale System, although revised over time,
have remained remarkably constant since their introduction in the 1920s. Summarized
by Vernon Lippard, who succeeded C.N.H. Long as Dean in 1952, the plan included
the following four characteristics:

1. The required dissertation;
2. Lack of fixed course requirements for qualified students;
3. Emphasis on elective courses; and
4. Absence of required course examinations [76].

Dean Lippard, writing in 1954, referred to the Yale Plan as one which had
“evolved.” He wrote that he believed its essential feature was “that the faculty [was]
concerned with guiding and stimulating a group of intelligent young men and women
rather than in drilling and examining them.” He believed with Samuel Harvey that
“teachers and their attitudes [were] more important than curriculum structure and methods.” Curricula will always be revised, he wrote, but “[u]nless the student is given an opportunity to think for himself, is given time for pursuit of special interests and, most important, is freed from frequent course examinations and constant attendance at didactic lectures and recitations” all reform efforts will be useless [77].

Lippard concluded his paper with a quote from Yale’s President, A. Whitney Griswold. Yale’s fundamental purpose, wrote Griswold, is “the training of men by the cultivation of their individual powers of reason and conscience for the broadest possible responsibilities in our Society.” Lippard then commented, with characteristic humility, that Yale’s program over the years “[had] been successful to a considerable extent in the attainment of that goal” [78].

It is difficult to disagree with Dean Lippard. The “Yale System” of medical education, as Dean Long called it in 1947, or the Yale “program,” “philosophy,” or “plan” as it was originally called by Deans Winternitz, Bayne-Jones, and Blake, has been the fundamental basis of contemporary Yale medical education. It has, for better or worse, given the School its “individuality,” its “character,” its “distinctiveness.” Introduced at a time when medical education was didactic and recitative, and medical students common grinds, the System treated students as adults, as proper graduate students, as equals in the adventure of learning. Initiative, independence, and freedom were the System’s hallmarks, and although many faculty, mostly those who came of age after the introduction of the System, disagreed with certain features, most were unwilling to abandon the fundamental philosophy, agreeing with both Winternitz and Peters that the System had given the School its distinctive “personality.”

Yet external exigencies had favored change. As new subjects and topics and subspecialty interests emerged in the preclinical and clinical departments, they found their way into the curriculum first as electives and then, when students, excited by the electives’ potentiality and utility had enrolled in large numbers, found their way into the curriculum as required courses. A constant adjustment process was necessary to weed out certain courses and to introduce new ones, lest the curriculum again be overloaded with required courses.

Similarly, the thesis was of constant concern. Prior to 1927 everyone submitted a thesis, but before the pruning of required courses in 1925, the theses were of “limited value,” which is why Hussey barely mentions them in his 1927 report. Soon thereafter, students, with more time to do research, found themselves contributing new facts to medical science, communicating “an impulse to the wheel in medicine’s complicated machinery,” and “awakening in themselves a spark of character which [would continue] through life” [79]. But even the thesis was not inviolate. When World War II broke out, after the course of study was accelerated and many faculty and potential M.D. thesis advisers left for military service, the decision was made to make the thesis elective, a decision which lasted for but a mere two years, such was its accepted value.

Small-group teaching in seminars and study sections was also an important feature of the Yale Plan. Although the majority of students attended lectures, students looked forward to the seminars and discussion groups where, in a more relaxed and non-anonymous environment, topics and problems could be taken to bits and learning truly enhanced. In the twenties and thirties, this feature of the Yale Plan often placed a burden on the teaching faculty, as they were few in number, but, as students and many faculty supported and applauded the small-group concept, the way to assure its success was simply to hire additional faculty, as Burr had earlier recommended.
Another change in the System related to the evaluation of students. It is here that the greatest disagreement had occurred. Dean Winternitz was utterly opposed to course exams and quizzes, as these, in Hussey's words, "discourage[d] the proper type of study." Many faculty, however, were concerned that this was too radical a departure from tradition. The comprehensive qualifying examinations, consisting of three or four parts, written and administered by the faculty, were believed to be a far better judge of a student's abilities than was factual regurgitation, as was, in Harvey's opinion, common practice in other schools. Yet the qualifying exam itself was under continual attack. The hope for the exam was that students, preparing not for courses but for subjects, would be able to study independently, determining for themselves the integrative nature of the desultory bits and pieces they had learned, and, when examined, would be in a position to correlate their knowledge. Such had not happened, as each preclinical department wrote exam questions not to measure a student's ability to correlate knowledge, but in order to measure how much or how little a student knew about a particular discipline. Parts of the exam, such as the essay and the practical, had proved unwieldy and difficult to measure, and it was uncertain if external examiners from other medical schools should be added to the School's own examining board. The two-part exam of the Board of Medical Examiners was eventually substituted for the comprehensive qualifying exam in 1932, but was abandoned in 1937, only to be reinstituted once again during World War II. Winternitz, Harvey, and Burr, those of the generation which established the Yale Plan, believed in the external exam; those who helped bring to the medical school the "new" basic and clinical science sought for more accurate measures of the students' progress. The dynamic tension so apparent then appears resurgent in groups with similar predilections today.

A final word is necessary. The Yale System, which has evolved for over sixty years, been modified and fine tuned, remains the most distinguishing feature of Yale medicine. Pedagogic experiments, curricula revisions, courses, even departments, sections, institutes, and deans have come and gone, but the Yale System remains the essential ingredient in the mix of elements which has made Yale's School of Medicine the truly exceptional school it has been these many years.

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