"There are areas of experience where we know that uncertainty is the certainty."

—James B. Conant

Voluminous texts, crammed notebooks, and tightly-packed memories of students at Cornell University Medical College attest to the "enormous amount" of established medical knowledge they are expected to learn. It is less commonly recognized that they also learn much about the uncertainties of medicine and how to cope with them. Because training for uncertainty in the preparation of a doctor has been largely overlooked, the following discussion will be focused exclusively on this aspect of medical education, but with full realization that it is counterbalanced by "all the material [students] learn that is as solid and real as a hospital building."

There is of course marked variation among students in the degree to which uncertainty is recognized or acknowledged. Some students, more inclined than others to equate knowing with pages covered and facts memorized, may think they have "really accomplished a lot...gained valuable knowledge," and that what they have learned is "firmly embedded and clear in their minds." Other

1 Unless otherwise indicated, all the quoted phrases and passages in this paper are drawn from the diaries of eleven Cornell students at various points along the medical school continuum have kept for us over the course of the past three years; from interviews with these student diarists and some of their classmates; and from close-to-verbatim student dialogue recorded by the sociologist who carried out day-by-day observations in some of the medical school situations cited in this paper.
students are more sensitive to the "vastness of medicine," and more conscious of ignorance and superficiality in the face of all they "should know," and of all the "puzzling questions" they glimpse but cannot answer. Many students fall somewhere between these two extremes, half-aware in the course of diligent learning, that there is much they do not understand, yet not disposed "at this point to stop and lament." Discussion will be limited to the training for uncertainty that seems to apply to the largest number of students, admitting at the outset that inferences from the data must be provisional.

THE KINDS OF UNCERTAINTY THAT THE DOCTOR FACES

In Western society, where disease is presumed to yield to application of scientific method, the doctor is regarded as an expert, a man professionally trained in matters pertaining to sickness and health and able by his medical competence to cure our ills and keep us well. It would be good to think that he has only to make a diagnosis and to apply appropriate treatment for alleviation of ills to follow. But such a Utopian view of the physician is at variance with facts. His knowledge and skill are not always adequate, and there are many times when his most vigorous efforts to understand illness and to rectify its consequences may be of no avail. Despite unprecedented scientific advances, the life of the modern physician is still full of uncertainty.²

Two basic types of uncertainty may be recognized. The first results from incomplete or imperfect mastery of available knowledge. No one can have at his command all skills and all knowledge of the lore of medicine. The second depends upon limitations in current medical knowledge. There are innumerable questions to which no physician, however well trained, can as yet provide answers. A third source of uncertainty derives from the first two. This consists of difficulty in distinguishing between personal ignorance or ineptitude and the limitations of present medical knowledge.

²It is not only the doctor, of course, who must deal with the problem of uncertainty. To some extent this problem presents itself in all forms of responsible human action. The business executive or the parent, for example, has no assurance that his decisions will have the desired results. But the doctor is particularly subject to this problem for his decisions are likely to have profound and directly observable consequences for his patients.

edge. It is inevitable that every doctor must constantly cope with these forms of uncertainty and that grave consequences may result if he is not able to do so. It is for this reason that training for uncertainty in a medical curriculum and in early professional experiences is an important part of becoming a physician.

An effort will be made to identify some experiences as well as some agencies and mechanisms in medical school that prepare students for uncertainty and to designate patterns by which students may gradually come to terms with uncertainty. In the initial inquiry we shall content ourselves with a general view of the sequence through which most students pass, but in a concluding section we shall suggest some variations that might be considered in further investigation of training for uncertainty.

THE PRECLINICAL YEARS

Learning to Acknowledge Uncertainty

The first kind of uncertainty which the student encounters has its source in his role as a student. It derives from the avoidance of "spoon-feeding," a philosophy of the preclinical years at Cornell Medical College (as at many other medical schools).

You will from the start be given the major responsibility for learning [students are told on the first day that they enter medical school]. Most of your undergraduate courses to date have had fixed and circumscribed limits; your textbooks have been of ponderable dimensions. . . . Not so with your medical college courses. . . . We do not use the comfortable method of spoon-feeding. . . . Limits are not fixed. Each field will be opened up somewhat sketchily. . . . You will begin to paint a picture on a vast canvas but only the center of the picture will be worked in any detail. The periphery will gradually blur into the hazy background. And the more you work out the peripheral pattern, the more you will realize the vastness of that which stretches an unknown distance beyond. . . . Another common collegiate goal is to excel in competition with others. . . . But] because an overly-competitive environment can hinder learning, student ratings are never divulged [in this medical school], except to

³This particular sentence was taken from the "Address of Welcome to the Class of 1957" delivered by Dr. Lawrence W. Hanlon. Everything else in the paragraph quoted above is extracted from "Some Steps in the Maturation of the Medical Student," a speech delivered by Dr. Robert F. Pitts at Opening Day Exercises, September 1952.
Processes of Attitudinal Learning

the extent that once a year each student is privately informed as to which quarter of the class he is in.

From the first, the medical school rookie is thus confronted with the challenge of a situation only hazily defined for him. Information is not presented "in neat packets"; precise boundaries are not set on the amount of work expected. Under these conditions the uncertainty which the beginning student faces lies in determining how much he ought to know, exactly what he should learn, and how he ought to go about his studies.

This uncertainty, great as it is, is further accentuated for the beginner by the fact that he does not receive grades, and therefore does not have the usual concrete evidence by which to discover whether he is in fact doing well:

In college, if you decide to work very hard in a course, the usual result is that you do very well in it, and you have the feeling that studying hard leads to good grades. You may tell yourself that you don't give a damn about grades, but nevertheless, they do give you some reassurance when you ask yourself if the work was worth it. . . .

In medical school, there is no such relationship. Studying does not always lead to doing well—it is quite easy to study hard, but to study the wrong things and do poorly. And if you should do well, you never know it. . . . In my own case, I honestly think the thing that bothers me most is not the lack of grades, but rather the feeling that even after studying some in a given course, I always end up knowing so little of what I should know about it. . . . Medicine is such an enormous proposition that one cannot help but fall short of what he feels he should get done. . . .

Thus, it would seem that avoidance of spoon-feeding by the preclinical faculty encourages the student to take responsibility in a relatively unstructured situation, perhaps providing him with a foretaste of the ambiguities he may encounter when he assumes responsibility for a patient.

From the latter parts of the comment under review it would appear that the same teaching philosophy also leads to the beginning awareness of a second type of uncertainty: by making the student conscious of how vast medicine is, the absence of spoon-feeding readies him for the fact that even as a mature physician he will not always experience the certainty that comes with knowing "all".

Training for Uncertainty

there is to know" about the medical problems with which he is faced. He begins to realize that no matter how skilled and well-informed he may gradually become, his mastery of all that is known in medicine will never be complete.

It is perhaps during the course of studying Gross Anatomy that the student experiences this type of uncertainty most intensely. Over the centuries this science has gradually traced out what one medical student describes as the "blueprint of the body." As a result of his struggle to master a "huge body of facts," he comes to see more clearly that medicine is such an "enormous proposition" he can never hope to command it in a way both encompassing and sure:

. . . Men have been able to study the body for thousands of years . . . to dissect the cadaver . . . and to work on it with the naked eye. They may not know everything about the biochemistry of the body, or understand it all microscopically . . . but when it comes to the gross anatomy, they know just about all there is to know. . . . This vast sea of information that we have to keep from going out the other ear is overwhelming. . . . There's a sense in which even before I came to medical school I knew that I didn't know anything. But I never realized it before, if you know what I mean—not to the extent that it was actually a gripping part of me. Basically, I guess what I thought before was, sure, I was ignorant now—but I'd be pretty smart after a while. Well, at this point it's evident to me that even after four years, I'll still be ignorant. . . . I'm now in the process of learning how much there is to learn. . . .

As in this case, the student's own sense of personal inadequacy may be further reinforced by the contrast he draws between his knowledge and that which he attributes to his instructors. Believing as he does that "when it comes to the gross anatomy, they know just about all there is to know," he is made increasingly aware of how imperfect his own mastery really is.

There are other courses and situations in preclinical years which acquaint the Cornell student with uncertainties that result, not

4 Such a felt sense that there will always be more to learn in medicine than he can possibly make his own, is the beginning of the medical student's acceptance of limitation. It might also be said that this same realization is often one of the attitudinal first signs of a later decision on the part of a student to enter a specialized medical field. This is of some relevance to the discussion of specialization by Patricia L. Kendall and Haman C. Salvin, "Tendencies toward Specialization in Medical Training," in this volume.
from his own inadequacies, but from the limitations in the current state of medical knowledge. For example, standing in distinction to the amassed knowledge of a discipline such as Gross Anatomy is a science like Pharmacology, which only in recent years has begun to emerge from a trial-and-error state of experimentation:

Throughout the history of pharmacology, it would appear that the ultimate goal was to expedite the search for agents with actions on living systems and to provide explanations for these actions, to the practical end of providing drugs which might be used in the treatment of the disease of man. As a result of many searches there now exist such great numbers of drugs that the task of organizing them is a formidable one. The need for the development of generalizations and simplifying assumptions is great. It is to be hoped that laws and theories of drug action will be forthcoming, but the student should at this point appreciate that few of them, as yet, exist.\(^8\)

The tentativeness of Pharmacology as a science, then, advances the student’s recognition that not all the gaps in his knowledge indicate deficiencies on his part. In effect, Pharmacology helps teach medical students that because “there are so many voids” in medical knowledge, the practice of medicine is sometimes largely “a matter of conjuring... possibilities and probabilities.”

When Charles was over for dinner last week, I remarked at the time that I was coming to the conclusion that medicine was certainly no precise science, but rather, it is simply a matter of probabilities. Even these drugs today, for example, were noted as to their wide range of action. One dose will be too small to elicit a response in one individual; the same dose will be sufficient to get just the right response in another; and in yet another individual, the same dose will produce hyper-sensitive toxic results. So, there is nothing exact in this, I guess. It’s a matter of conjuring the possibilities and probabilities and then drawing conclusions as to the most likely response and the proper thing to do. And Charles last week agreed that a doctor is just an artist who has learned to derive these probabilities and then prescribe a treatment.

In Pharmacology (and in the other basic medical sciences as well) it is assumed that “laws and theories will be forthcoming” so that the uncertainties which result from limited knowledge

ology emphasizes the limitations of current medical knowledge; and his training in observation, particularly in Physical Diagnosis, confronts him with the problem of distinguishing between his own limitations and those in the field of medicine. But in his second year his participation in autopsies simultaneously exposes the student to all these uncertainties. The autopsy both epitomizes and summarizes various other experiences which together make up the preclinical student's training for uncertainty.

Before witnessing their first autopsy, second-year students may, on occasion, sound rather complacent about the questions which death poses. For example, speculating on the causes of death, one group of Sophomores decided to their satisfaction that the cessation of life could be explained in simple physiological terms and that, armed with this knowledge, the doctor stands a good chance of "winning the fight" against death:

We found that one very important matter could be traced back to one of two basic actions. The important matter—death. The two basic actions—the heart and respiration. For death is caused, finally, by the stopping of one of these two actions. As long as they both continue, there is life. . . . It's all a fight to keep the heart beating, the lungs breathing, and, in man, a third factor—the brain unharmed. . . . With all the multitude of actions and reactions which are found in this medical business, it seems strange and satisfying to find something that can really be narrowed down . . . .

But the conviction that death "can really be narrowed down" is not long-lasting. Only a short time later, commenting on an autopsy he had just witnessed, one of these same students referred to death with "disquietude" as something you "can't pinpoint" or easily prevent.

One of the chief consequences of the student's participation in an autopsy is that it heightens his awareness of the uncertainties that result from limited medical knowledge and of the implications these uncertainties have for the practicing doctor. This is effected in a number of ways. To begin with, the experience of being "on call" for an autopsy ("waiting around for someone to die") makes a student more conscious of the fact that, even when death is expected, it is seldom wholly predictable:

In groups of threes, we all watch at least one autopsy—and my group is the third one in line. The first group went in for theirs this morning; this means that ours may come any time now. You can't be sure when, though, so you have to stay pretty close to home where you can be reached . . . .

In other words, although ultimate death is certain, medical science is still not far enough advanced so that the physicians can state with assurance exactly when an individual will die.

Of even greater importance, perhaps, in impressing the student with the limitations of current medical knowledge is the fact that, although the pathologist may be able to provide a satisfactory explanation of the patient's death, the student usually finds these "causes of death" less "dramatic" and specific than he expected them to be:

While our case was unusual, it was a bit of a letdown to me, for there was nothing dramatic to be pointed to as the cause of death. The clinician reported that the patient had lost 1,000 cc. of blood from internal bleeding in the G.I. tract. . . . Well, we saw no gaping hole there. There was no one place you could pinpoint and say: "This is where the hemorrhage took place." . . . Rather, it was a culmination of a condition relating to various factors. I suppose most causes of death are this way. But still . . . (though I'm not really sure why it should be) . . . it was somewhat disquieting to me.

A third limitation of the field is implied in lack of control over death. For example, the student observes that "the various doctors connected with the case being autopsied . . . wander in while the procedure is going on." This serves to remind him that the "body on the autopsy table" belongs to a patient whose death no physician was able to prevent.

It is not only the limits of the field which are impressed upon the student during his participation in an autopsy. This experience also serves to make him aware of the personal limitations of even the most skilled practitioners. For instance, an autopsy gives a student an opportunity to observe that "the doctors aren't always sure what caused the patient's death"; rather, as one student puts it, "they come . . . to find out what was really wrong." Furthermore, the student may be present at an autopsy in which the pathologist's findings make it apparent that the physician was mistaken in his diagnosis (when, for example, the pathologist "doesn't find any of the things in the doctors' diagnoses"). From experiences such as these the student learns that, not only he, but also his
structors have only an imperfect mastery of all there is to know in medicine.

These varied aspects of the autopsy, in other words, give it central significance in the student's training for uncertainty.

**Learning to Cope with Uncertainty**

In describing the various kinds of uncertainty to which a student is exposed during his preclinical years at Cornell, we do not mean to portray him as groping helplessly around in the midst of them. On the contrary, as time goes on, a student begins to develop effective ways of dealing with these forms of uncertainty, so that, gradually, he becomes more capable of meeting them with the competence and equipoise of a mature physician.

To begin with, as a student acquires medical knowledge and skill, some of his uncertainty gives way. "A more complete and satisfying picture of the organism takes shape" in his mind. Gradually, "the missing jigsaw puzzle pieces seem to fall into place, and [he] sees interconnections and interrelationships between all subjects." The student also feels more at home looking in a microscope; he finds it easier to draw slides; he begins to have more confidence in what he sees and hears in Physical Diagnosis; and he becomes more adept at talking to patients. In all these respects, cognitive learning and a greater sense of certainty go hand in hand.

Growing competence and more experience decrease the student's uncertainty about his personal knowledge and skills; this, in turn, modifies his attitude toward the uncertainties which arise from limitations in the current state of medical knowledge. It will be remembered that, at first, the preclinical student goes through a period in which he is inclined to regard his uncertainty as reflecting his personal inadequacy. During his early days in Physical Diagnosis, for example, a student is likely to dismiss the uncertainty he may feel about "how much percussion tells [him]" in a particular instance, by saying that he thinks he is "probably wrong" to have doubts in the first place and that giving vent to these doubts might make him "look like a fool":

For example, I can see that percussion *does* tell you a lot, and that in most cases, the borders of the heart *can* be percussed. What it amounts to really is not that I doubt it, but that I can't do it. . . . It's all very well and good [to express your doubt], but if it turns out that you're the only one who seems to be having so much trouble, you begin to look like a fool after a while if you do. . . . We don't really know enough yet so that we can afford not to take a positive stand. . . .

With the growth of his knowledge and skill, however, and the widening and deepening of his experience, a student's perspective on his own uncertainty changes. Now that he "knows a little more" and is a "little more sure of himself," a student says, he realizes that although some of his uncertainty is attributable to his "ignorance," some of it is "really well-justified." By this he means that he is better able to distinguish between those aspects of his uncertainty that derive from his own lack of knowledge and those that are inherent in medicine. He is therefore less apt to think of his uncertainty as largely personal and now considers it more appropriate to give voice to the doubts he feels.

This more "affirmative attitude" toward doubting (as one student calls it) is not only a product of book knowledge and skill in the techniques of physical diagnosis. It also results from what a student learns about the uncertainties of medicine through his daily contact with members of the faculty. From time to time in the classroom, for example, a student will ask what he considers a "well-chosen question" only to discover that his teacher "does not have immediate command of the known medical facts on that point" or to be told that the problem into which he is inquiring "represents one of the big gaps in medical knowledge at present." In the autopsy room, as we have seen, a student is struck by the fact that the pathologist cannot always explain the causes of death and that, although the "doctors' diagnoses are often right, they can also be wrong." Examining patients under the supervision of clinical faculty, a student discovers that when "different instructors listen to (or feel or see) the exact same thing, they frequently come up with different impressions. . . . and have to consult one another before they reach a final conclusion."

In short, observing his teachers in various classroom and clinical situations makes a student more aware of the fact that they are subject to the same kinds of uncertainty that he himself is ex-
experiencing. Furthermore, the student notes that when his instructors experience these uncertainties, they usually deal with them in a forthright manner, acknowledging them with the consistency of what one student has termed a “philosophy of doubting.” Thus, a student's relationship to the faculty, like his advances in knowledge and skill, encourages him to accept some of his uncertainty as “inevitable” and thoroughly “legitimate” and to handle that uncertainty by openly conceding that he is unsure.

Another process by which the student learns to face up to uncertainty in an unequivocal manner is connected with his membership in the “little society” of medical students, for a medical school class is a closely-knit, self-regulating community, with its own method of “tackling a big problem” like that of uncertainty.

Through a process of “feeling each other out,” the group first establishes the fact that uncertainty is experienced by “everyone,” thereby reassuring a student that his own difficulties in this regard are not unique:

As always, the biggest lift comes from talking to other students and finding that they have felt the same way. You may do this by a few casual jokes, but you know there is more to it than that.

Secondly, out of the more than “casual joking, asking around and talking to others” that constantly go on among students, a set of standards for dealing with uncertainty gradually emerges—standards that tend to coincide with those of the faculty:

Suppose I should talk real enthusiastically about the job of dissection I did [a Freshman explains]. Well, Earl will say, “Gee, I'm a great guy, too, you know,” or something to that effect. From that remark, I can tell I'm bragging too much. That cues me in, so I make a mental note not to brag so much the next time. . . . Because you don't talk about your successes to the group as a whole. It's sort of understood that you don't try to impress each other. . . . A lot of the fellows belittle themselves. . . . I mean, a fellow will say, for example, that he thought a certain structure was a lymph node and that it turned out to be something entirely different. Then he and everyone else will laugh a lot over that . . .

If he acts presumptuous about his knowledge, a student will be reproached by his classmates whereas an admission of ignorance on his part may evoke their approval. From their positive and negative reactions, a student learns that his classmates, like his teachers, expect him to be uncertain about what he knows and candid about his uncertainty. (As one student puts it, “It really isn’t fashionable to believe much or to be overly sure.”)

“Summing up is pretty tough,” a Sophomore writes, taking stock as his second year draws to a close:

The uncertainty of first year is missing. You feel now as though you have a very shaky hold on a great deal of knowledge. You rather expect that the next two years will be spent getting a better hold on the things you are already familiar with. . . . We are half way through. To some people this is quite a milestone. . . . The realization that one day we will be doctors—finished with medical school—is now in the back of our minds. But few people have a definite idea of what they want to do. . . . For the most part, I think our class is looking forward to the third year, although there is a certain uneasiness about the idea of presenting yourself to the patient as a doctor. . . .

In some respects confident and knowing, in others uneasy and not sure, a student feels variously certain and uncertain as he makes the transition from the preclinical to the clinical years of medical school.

THE CLINICAL YEARS

The Kinds of Uncertainty Facing the Third-Year Student

The kinds of uncertainty experienced by a third-year student are qualitatively the same as those he encountered in his preclinical years. First, there is the uncertainty that comes with realizing that, despite all the medicine a student has mastered and all he will learn, he can never hope to “shovel out more than a corner of what there is to know”:

Studying medicine is a lot like digging a hole in the sand. You get down there and start digging, but it seems as though every shovelful you toss out, some more slides in. And of course, when you dig any hole, you never get to the bottom. . . . If you were to ask me how I felt about medicine now, and you happened to catch me in a moment of honesty, I'd tell you that I'm completely overwhelmed by a feeling of lack of knowledge. . . .
Secondly, when he meets clinical problems that "even stump the experts," a third-year student is confronted with uncertainty that derives from the limitations of medical science:

Ted and I got to talking about some of the revelations of third year, and one of the things that has struck him is that there isn't a diagnosis for everything. He has more or less assumed that there was always a diagnosis that could be made, and especially that a resident or attending should have no trouble making one. But this year, he has discovered that even a sharp attending like Dr. ___ can be stumped...

Uncertainty over how to distinguish his own inadequacies from those which are general to the field continues to pose a problem for the student. If he has trouble with a venipuncture, for example, or does what he considers a "hack-job" in "working up" a patient, a student wonders if "it's mostly due to the fact that [his] talents just don't run toward being a doctor" or if his difficulty is largely attributable to the poor condition of the patient's veins and to the objective intricacy of her case.

But if the uncertainties of third year are like those with which a student is already acquainted and to which he has become partly inured, there is a sense in which the third year at Cornell seems to intensify the degree of uncertainty. As one student puts it:

Starting third year is a little like starting medical school all over. Everything is new, and you don't know what to expect or to plan for...

Because the third year represents a major transition point in a student's training—it is the beginning of his total immersion in clinical medicine—the uncertainties he encounters at first seem greater to him than those he encountered as a Sophomore.

In spite of his enthusiasm over working on the wards and in the clinics of the hospital, a third-year student looks back somewhat wistfully on what he regards as the relative "organization and continuity of the academic classroom." How do you "approach learning," he wonders, "now that things are no longer grouped by courses—and the choice of what to study is so completely your own?" For example, suppose you want to read up on headache... You can read a two-page section in the Merck Manual, a five-page section in Cecil, a thirty-page section in a book called Signs and Symptoms, or recent articles in the journals...

"Which is best is very hard to decide." Part of the student's difficulty in evolving a plan of study lies in the fact that what he is really seeking is nothing less than an organized way of learning to think like a doctor. During the third year at Cornell the student reaches out to make the process of differential diagnosis and the logic of rational treatment more conclusively his own.

As a student quickly discovers, however, the way of thought of the doctor is something other than a sum total of the ideas he has already mastered. Neither the principles he has learned in the basic medical sciences nor his book knowledge of disease processes automatically equip him to think like a doctor:

The basic principles of medicine are very difficult things to catch hold of [a third-year student writes]. In engineering, once you really understand a principle, it stays with you, and you feel confident you will be able to use it in attacking a wide range of new problems. If you really understand mechanics, you can do anything with it, and you don't have to worry so much about whether certain things are true in one case and not in another. The problems may be new tomorrow, but the basic principles don't change (much).... With medicine, it's different.... There are as many exceptions as there are rules... and the important things in one case don't count in another... You can't read the chapter and "figure out the problem"

*Within the limited confines of this paper, we have chosen to treat the third year as a unit—for the most part ignoring the fact that it is actually made up of a series of microcosms. The third year at Cornell is divided into three terms: (1) Medicine; (2) Surgery; (3) Obstetrics-Gynecology; Pediatrics; Public Health; Psychiatry. And the class itself is divided into three groups that rotate through these various terms—some taking Medicine first, some Surgery, some Obstetrics-Gynecology, etc. Further, these three groups are, in turn, subdivided—half taking their medical clerkships at New York Hospital first, half at Bellevue first (and then interchanging); half taking Pediatrics first, half Obstetrics-Gynecology first (and interchanging, too). Again, within each of these terms, even more subdivisions take place. For example, the students go two-by-two to the palpation clinic while on Obstetrics-Gynecology; on Medicine, they are broken up into tutorial groups containing five students apiece, and so on. In the section that follows, we will only allude to the differences between the trimesters of the year and the wide dispersion of the student group. Though our discussion of it here is cursory, the effect that the "geometry" of third year has on students merits future study.

in medicine. And it is the greatest folly to argue with an instructor (a good one) with only the chapter behind you. You can say, "Cecil says . . ." but if he's seen patients with such-and-such for twenty years, then he probably has you. In other words, years of experience don't modify the principles of the engineering book, but in medicine they do . . .

Along with the change in organization and the different way of thought, the divided nature of the third year augments the uncertainty to which a student is subject:

The class is pretty split up these days . . . Lunch is the only time you see friends you are otherwise completely out of contact with. You are all doing different things, and it is really very nice to get a chance to eat together and talk about them . . .

Separated from some of the people on whom he depended for confirmation and support and now asked to see patients alone, a third-year student is called upon to meet uncertainty in a more solitary fashion:

Last year, if you thought you felt a liver, for instance, but you weren't quite sure, there were always two or three other fellows there, and you could ask them if they felt it too. But this year, we see patients alone. So we're more on our own now . . .

Perhaps most important of all in quickening a student's sense of uncertainty is his conviction that "third year is the year when the whole jump is made, and you learn to be a doctor." What is called for now, he says, is "knowing enough to do justice to your patients."

. . . You get to the point where you say I should know these things . . . Otherwise I'll be cheating my patients . . . In that respect, I feel like a doctor already . . .

In general, then, the uncertainty of third year is compounded for a student by his "developing sense of responsibility." As he becomes aware of the imminence of his doctorhood, "gaps in [his] knowledge" or unsureness on his part seem more serious to a beginning third-year student than they formerly did.

The Certificate of the Third-Year Student

Although a student may tell you at the outset of the third year that he feels "a little bit like a pea on a griddle" (dwarfed by medicine and alone in some ways), he does not continue to sound so unsure of himself. As the year unfolds, a student's initial uncertainty gradually gives way to a manner of certitude. One gains the impression that students are more uncertain during the first part of the third year than they were before, but that they become less uncertain than before during the later part of the third year. There seem to be several reasons for this.

In the atmosphere of the "clinical situation," a student can feel his medical knowledge take root. The "chance to see many of the things [he] has read about" reinforces what he has previously learned; and the fact that "there is a patient lying there in bed proves" to him that what he is currently learning is "really important."

However, the growing assurance of a third-year student does not result only from his greater knowledge and his conviction that what he is doing is important. It results also from the fact that in the third year he is relatively insulated from some of the diagnostic and therapeutic uncertainties he will encounter later. For one thing, the acute illnesses he sees on the wards and the explicit problems he handles in the clinics are often "classic" or so manifest that he says they seem almost "obvious" to him. For another, the responsibilities a third-year student is asked to assume are carefully circumscribed. Although he now has more responsibility than he did when he was a preclinical student, he has considerably less than he will have later, as a fourth-year student or practicing physician. His duties on the wards do not go beyond taking a history, doing a physical examination, and carrying out indicated laboratory tests. When it comes to the problems of treating a patient, the student is largely an onlooker. He does not have to decide upon medicaments and other therapeutic procedures—weighing the potential risks involved against the possible benefits that may accrue to his patients. A student's responsibilities in the clinic are equally limited and specific. In the surgery specialty clinics, for example, his diagnoses are restricted to those facets of a patient's problems that are encompassed by the particular specialty he is
representing at the time. The only therapy for which he is responsible is “fairly simple and concrete”: treating infections, removing sutures, and dressing wounds, for example, such as he does on Minor Surgery.

In effect, the delimited nature of his responsibilities frees a student from the necessity of coping with diagnostic and therapeutic uncertainties that fall outside a narrow orbit. Even in the General Surgery clinic where he deals with a wider range of medical problems in a more comprehensive way, the student is protected from many clinical uncertainties. In General Surgery (and in his other clinics as well) a student rarely sees a patient more than once. It is usually only in retrospect that he catches a glimpse of the uncertainties he might have encountered had his relationship with patients been continuous. For example, reviewing the charts of patients he examined in General Surgery as a Junior, a fourth-year student was “amazed to discover” that some of the cases he saw were never resolved:

... One poor woman had a negative GB series (I thought she had gall bladder disease); was seen by someone else and had a negative GI series (he thought she had an ulcer); was seen by someone else and had a negative proctoscopy and Ba. enema (he thought she had Ca. of the colon). She then went to another clinic and had two more negative GI series because someone there thought she had a Meckel’s diverticulum. On her last visit, someone wrote down “irritable colon” and treated her with “reassurance.” ...

His close relationship to the clinical faculty is another source of a third-year student’s increasing assurance:

During the first two years it was possible to remain completely removed from the faculty and yet still do O.K. by reading and going to lectures. While some departments made an effort to develop a close student–faculty relationship, you never had to depend on this to get the things you were supposed to. But now only 50% of what we need can come from books. The other 50% has to come from the teachers we work with. And so, there is a 180-degree shift in the class’ relation to the faculty. ...

One of the factors that may persuade a student to enter a specialized field within medicine is that narrowing the scope of practice also narrows the range of potential uncertainty with which he will have to deal as a doctor. For further discussion of this point, see Patricia L. Kendall and Hana G. Selvin, “Tendences toward Specialization in Medical Training,” in this volume.

Because he finds that listening to experienced doctors reason out loud is the only way he can get “a sense of how to approach clinical problems,” the third-year student welcomes the opportunity to learn through direct contact with his instructors. Meeting with members of the faculty or house staff in small intimate groups and discussing patients with them is “the heart of clinical medical education,” so far as a student is concerned. Sessions like these, he says, “give [him] insight into how a doctor organizes and uses his information,” and a “real sense of colleagueship.” (“You catch the feeling you must have in a craft; the father passing the secrets of the craft on to the son.”) The closeness of his relationship to the faculty in the third year helps a student to think and feel more like a doctor, and consequently fosters his sense of certainty.

In these respects, the student acquires greater assurance during the course of his third year at Cornell. He also adopts a manner of certitude, for he has come to realize that it may be important for him to “act like a savant” even when he does not actually feel sure. From his instructors and patients alike a student learns this lesson: that if he is to meet his clinical responsibilities, he cannot allow himself to doubt as openly or to the same extent that he did during his preclinical years. Instead, he must commit himself to some of the tentative judgments he makes, and move decisively on behalf of his patients:

Dr. T’s philosophy goes something like this. ... “You boys are to handle the case as you see best. I put no restrictions on you from this point of view. You do the work-up, decide what’s to be done, and whatever you decide is all right. But I insist on this much—you must stand up for your decisions, never apologize for what you are doing, and never start getting humble and say you don’t know....”

The third-year student learns from his instructors that too great a display of unsureness on his part may elicit criticism; from his patients he learns that it may evoke alarm:

To say that the patient “searches your face” for clues is no overstatement. An example—while on OB, when trying to palpate a baby once, I got a little confused and frowned in puzzlement. Sensed at once that the mother saw the frown and was alarmed. So, I reassured her that everything was all right. I have always tried to remember not to do it again. ...
Yielding to the point of view of his instructors who enjoin him to be “firm and take a position,” to the desire of his patients to be assured, and to his own “need for definiteness” as well, a third-year student generally makes it his policy to “believe.”

I’m sure that on the higher levels of medicine you do admit your ignorance and avoid stereotyped thinking. But we are at the point now where you have to believe in the rule rather than the exception. Perhaps this is a phase you must pass through on the way up, just as you must learn that the heart does have a pacemaker before you learn that it doesn’t.

In sum, the assurance of a third-year student results from his progress in learning and his unawareness of many clinical uncertainties. He assumes a sure manner also because of his belief that “it is a mistake for a medical student at [his] stage of the game to doubt too much.”

Training for Uncertainty in the Comprehensive Care and Teaching Program

The sense of sureness expressed by students about to complete their third year at Cornell is, in some respects, premature. At any rate, the fourth-year student’s perspective on the uncertainties of medicine is usually different from that of a Junior:

Experience makes you less sure of yourself, [a Senior explains]. What you realize is that even when you’ve been out of medical school twenty years, there’ll be many times when you won’t be able to make a diagnosis or cure a patient. Instead of looking for the day, then, when all the knowledge you need will be in your possession, you learn that such a day will never come.

A fourth-year student who faces up to uncertainty in this way has departed considerably from his third-year self. Part of this change seems attributable to experiences in the Comprehensive Care and Teaching Program. A central feature of the Program is the extensive responsibility for patients which it allows students. Each student is assigned a number of patients who are defined as his patients, and he is expected to deal with all the problems that each case presents. Stemming from this degree of responsibility are varied situations and experiences which make the fourth-year student more aware of the uncertainties of medicine.

One important way in which students exercise the broad responsibility offered them is by following their patients over a period of months. This gives them more insight into the prevalence of uncertainties in the practice of medicine. What began as the “classical case” of Mrs. B., for example, illustrates this fact:

My new patient arrived first... Mrs. B., a thirty-two year old housewife and mother of two children, who had a sudden onset of typical thyroid symptoms complete with the physical findings to go with them.... I ordered several diagnostic tests for her and advised her to return in a week.

In this initial contact, the student-physician considered Mrs. B.’s case “typical,” and the tests which he ordered were presumably intended merely to confirm his diagnosis. There is no indication that he anticipated special difficulty in handling Mrs. B.’s problems.

On the second visit the student and the attending physician who was supervising him agreed that Mrs. B.’s case was clear-cut, and that surgery would be appropriate. But they did not reckon with the response of the patient to that proposal:

By the time I got to my second re-visit, Mrs. B., my toxic thyroid case, she had been waiting some time. She gave me the story of continuation of her previous symptoms with shaking even more apparent at present. Of the tests ordered, only the BMR came back, but this was conclusive, being 50% above normal. I informed her that all her problems were related to these findings, and after discussing her with Dr. D. told her that hospitalization and surgery were her best

33 For a more detailed description of the Comprehensive Care and Teaching Program and the kinds of experiences which students have in it, see the following papers in this volume: George G. Reader, “The Cornell Comprehensive Care and Teaching Program,” and Margaret Olencki, “Range of Patient Contacts in the Comprehensive Care and Teaching Program.”

34 The types of uncertainties a student encounters in the Comprehensive Care and Teaching Program seem to be like those he has dealt with recurrently since his days as a Freshman. However, it is no longer so easily possible to distinguish which fourth-year experiences are salient for which types of uncertainty. Rather, in the situations in which the fourth-year student finds himself all types of uncertainty seem to converge and to be intertwined. For this reason we have found it necessary here to modify the pattern set in earlier sections of this paper, and we talk now largely in terms of undifferentiated uncertainties.
chance for a permanent cure. At this she broke down in tears, and after composing herself, made many arguments against surgery. ... Dr. D. and I quickly agreed that I should treat her with propylthiouracil on an ambulatory basis until she has quieted down. This is an unnatural response to hospitalization and surgery, and I'll be interested in seeing if she becomes more logical with the quiescence of her toxic symptoms. ...

The patient's fear of an operation forced the student and the attending physician to adopt a plan of therapy which they believed was less effective than the one they originally set forth.

On a later visit the full complexity of Mrs. B.'s case became more apparent:

I went in to see Mrs. B. and found that the threat of her husband's quitting his job was related to hysterical crying most of the day. She admitted that her reaction wasn't wholly because of her disease state, but that she had been easily unnerved prior to this. I assured her that although this might be so, her thyroid was making it much worse, and that we would shortly be rid of part of it. ... She mentioned that a lump on her daughter's wrist was bothering her, and I suggested that she bring her in on the next visit. ... We discussed surgery at her initiation, and arrived at the same conclusion as before: my insistence that surgery was the best solution to her problem, and her insisting that she, her husband, and friends all agree that if a cure is possible without surgery, that it is to be embarked on. ... Mrs. B.'s emotional response to the diagnosis and recommendations made by the student-physician, her eagerness to accept the antisurgical opinions of her family and friends, her anxiety over her husband's job and her daughter's health all proved relevant to the appraisal and management of her case. With each visit it became more apparent to the student-physician that Mrs. B.'s problems were psychological as well as physical, and this realization evoked new questions. Was Mrs. B.'s long-standing nervousness wholly attributable to her disease state? Would it be possible to "ever get this woman over some of her anxious moments," and thus ready her for a needed operation? "I'm not too certain about any of these things," Mrs. B.'s student-physician reported at the end of his third visit with her. But had he seen her only once, this student would not have had any reason to alter his original impression that the case of Mrs. B. was diagnostically and therapeutically "clear-cut."
he deals; they often lead to his being deeply affected by these uncertainties. Because he is working with patients in a sustained way, a student is more susceptible to positive and negative countertransference than he was before entering the Program. As time goes on, he may become attached to some patients and alienated from others. Furthermore, the relatively large degree of responsibility assigned to him by the Program makes a student feel more accountable for what happens to patients than he formerly did. As a result, the uncertainties that a student experiences in the Program “make an emotional impact on [him],” so that he is sometimes inclined to react subjectively to the uncertain features of cases he cannot bring to a satisfactory conclusion. Usually these reactions involve the placing of “blame,” either on himself or on his patient:

I blame myself, not Mrs. H. [her student-physician declares]. I can’t get her to reduce, and I don’t know what I’m doing wrong. I have remained pleasant and sympathetic, but have applied strong urging and have registered disappointment (not wrath) at her failure to cooperate. . . . The reason I find her so difficult is that I feel if someone else were handling her, he could get the pounds off her. . . .

Mrs. C. has caused me quite a bit of consternation [another student asserts]. Though we have taken adequate physical measures to ascertain that her difficulty is on an emotional basis, she’s still showing bodily overconcern. . . . She complains of pains in her legs; that her arms are too weak; that she’s tired; that she feels pressure in her abdomen. . . . And then, these gripes about her husband. I can understand them in a way—because he’s the type of man who comes home from work, picks up his paper, looks at TV for a while, and then goes to bed without saying a word. . . . But she makes no effort to do anything about the situation. . . . She just sits there and tells me, “That’s the way he is. . . .” Another thing about this woman is, in all instances she will discontinue whatever treatment you prescribe and proceed on her own conception. . . .

The “failure” is his, the first student claims; it’s the “fault” of the patient and her environment, says the second.

As the cases of Mrs. H. and Mrs. C. suggest, a student is particularly apt to respond in one or the other of these affectual ways when the uncertainty he faces concerns either the social and psychological aspects of a patient’s illness, or his own management of the doctor–patient relationship. Partly because psychiatry and the social sciences are in a more embryonic stage of development than the disciplines from which medicine derives its understanding of the human body, the student encounters uncertainty more frequently in trying to handle the emotional and environmental components of his patient’s disorder than in trying to cope with problems that are largely physical in nature. The classification of psychological disturbances thus far evolved, for example, is not precise enough to permit a high degree of diagnostic exactitude. The relationship between social factors and illness is only beginning to be systematically explored. And most of the available methods for treating sociopsychological difficulties are still grossly empirical, their relative merits and demerits a focus of present day medical controversy, interest, and concern.

Intellectually, a student is aware of these things before he enters the Comprehensive Care Program; but he has not yet fully learned to acknowledge the uncertainties and limitations in this realm, or to proceed comfortably within the framework of such a realization. This is partly because, prior to his semester in the Program, a student has had little opportunity to take active responsibility for the “personal problems” of his patients. In the third year, for example, as we have seen, a student’s work centers primarily on physical diagnosis. The only personal therapy he has occasion to administer to his patients is a simple and limited form of reassurance, which, on the whole, he judges to be effective. His success in this respect he deems “understandable” for he is inclined to feel that the so-called art-of-medicine skills are based not so much on trained experience as they are on personal qualities. Such an attitude is reflected, for example, in the way that a number of third-year students look upon their psychiatry instructors:

There is a general feeling of great respect for most of the psychiatry people we have come in contact with [one student tells us]. We are impressed to note that the psychiatrist almost always suggests the honest, straightforward, direct approach to things . . . and most of us feel these people make sense. . . .

Yet “the regard we have for psychiatrists is not the same as the respect we have for surgeons,” this student goes on to say. In the
case of surgery, “it’s a matter of respecting skill,” in the case of psychiatry, “respecting common sense.”

This distinction is one that students carry with them into the Program. It helps explain the observed tendency of many students in Comprehensive Care to reproach themselves when they are unable to formulate the “human aspects of a patient’s case” or to decide upon an effective way of dealing with those aspects. (“I can’t get Mrs. H. to reduce . . . and I don’t know what I’m doing wrong.”) For a student who tends to regard problems like “getting the patient to lose weight” as more contingent on personal attributes than on learned skill, the case of Mrs. H. may seem to represent a personal failure on his part.

The more common tendency of a student to blame the patient under such circumstances is a different manifestation of the same emotional involvement. In the face of medical uncertainties that may impede his attempts to be decisive about the sociopsychological dimensions of the cases he handles, a student often projects his own sense of inadequacy upon the patient. In Comprehensive Care, for example, students frequently apply the epithet “crock” to “patients who do not have an organic lesion” or whose behavior appears to be “psychoneurotic.” “The central feature in all these patients we call ‘crock’ is that they threaten our ability as doctors,” one student points out. This is both because such patients do not respond to the diagnostic and therapeutic efforts of the student-physician in the way he would like (“You don’t get a foothold anywhere and do something to give them a better adjustment. . . .”), and because the student is emotionally “more vulnerable when thinking about the human aspects of a case, rather than just the strict medical problems involved.”

Whether you’re conscious of it or not, a lot of the things disturbed patients talk to you about are the kinds of things you’re likely to react to very strongly in a positive or negative way. . . . I mean, it’s all very well to say you’re not judging these people, for instance. But you can get annoyed as heck with some of them, or lose your sympathy even though you know they’re psychoneurotic. . . .

To sum up: the fourth-year student is repeatedly impressed by the diagnostic and therapeutic uncertainties he encounters in dealing with patients during his semester in Comprehensive Care.

Some of these uncertainties, he realizes, result from his own lack of medical knowledge and some from the limitations of medicine itself. In this respect, they are no different from those he has met at earlier points in his training. However, the physician-like responsibilities ascribed to him by the Program, along with the continuing and holistic nature of his relationship to patients, magnify the problem of uncertainty for the student, and make it harder for him to deal with it in a dispassionate way. In turn, the student’s emotional involvement increases the difficulty he has in distinguishing between those uncertainties that grow out of his personal ignorance and those that stem from the current limitations of medical science. It is particularly when he feels unsure about how to classify the ulcer-like symptoms of a Mr. T., or what to do about the obesity of a Mrs. H., that a student “doesn’t know whether [his] uncertainty is a reflection of his lack of knowledge and technique or whether such cases would be perplexing” even to more experienced physicians. As we have seen, a student is at first more apt to blame himself, or by projection, the patient, than he is to attribute his uncertainty to gaps in medical science.

Coming to Terms with Uncertainty in Comprehensive Care

The student’s increased awareness of uncertainties in medicine is of course not the chief by-product of his term in Comprehensive Care. The same experiences which lead to such awareness also enlarge his skills in the realms of diagnosis and patient management. From the absence of expected findings in a case like that presented by Mr. T., for example, he learns how to appraise conflicting evidence in arriving at a diagnosis. From the complex problems of Mrs. B. he learns something of the connection between emotional stress and physical illness and gains some experience in dealing with patients who are under such stress. When he leaves the Program the student, therefore, has considerably more confidence about his ability to cope with these problems than he did six months before.

Moreover, the fourth-year student finds ways of adjusting to his remaining uncertainties. The organization of the Comprehensive Care Program and some of its precepts help the student to recognize that he shares part of his uncertainty with fellow class-
mates and instructors. This enables him to meet his uncertainty with greater confidence and equipoise.14

In contrast to the many small groups into which the class is divided during the third year, half of the senior class is enrolled in Comprehensive Care at one time, spending a continuous six months together in the Program. This arrangement facilitates that kind of interchange between students which from the earliest days of medical school provided them with mutual aid and the supportive knowledge that "others feel the way they do."

In the process of a routine physical, I performed a pelvic and rectal, and the glove specimen of the stool was strongly guaiac positive! And I didn't quite know what to do. The patient lives in upstate New York and came to the City only when her husband drives in once a month. A decent GI workup would require her spending four full days at the Hospital. To further complicate matters, I wasn't sure of the significance of the positive test. I had rinsed my glove between pelvic and rectal, but the possibility of a positive test from blood in the vagina remains. . . . In the course of describing this experience at lunch, one of my classmates suggested that it was a crime to let her out of the building without a GI series, Ba. enema, and proctoscopy. He felt that even if subsequent stool examinations are negative, such a workup is obligatory. . . . This is the sort of decision I would prefer to force on someone else. I would feel foolish if such a workup showed nothing and subsequent stools were negative, but I'd feel worse if she showed up with an inoperable cancer a few months hence. . . . The lunch table of four was evenly divided on the question of what one should do if such a circumstance arose in general practice. . . . This problem is a real threat to the young physician. . . .

14An indication of the marked increase in confidence is contained in a simple statistical result. In May 1955, all four classes at Cornell were asked how capable they felt about dealing with a number of problems encountered by practicing physicians. One of these problems concerned "the uncertainties of diagnosis and therapy that one meets in practice." The class-by-class distribution of replies on this item was as follows:

<table>
<thead>
<tr>
<th>Percentage of each class</th>
<th>First year</th>
<th>Second year</th>
<th>Third year</th>
<th>Fourth year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quite sure I can deal with this</td>
<td>10</td>
<td>11</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Fairly sure I can deal with this</td>
<td>52</td>
<td>61</td>
<td>60</td>
<td>72</td>
</tr>
<tr>
<td>Not sure I can deal with this</td>
<td>58</td>
<td>28</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>No. of students</td>
<td>(82)</td>
<td>(82)</td>
<td>(85)</td>
<td>(85)</td>
</tr>
</tbody>
</table>

Although uncertainties such as these are "threatening," the student can perhaps find some reassurance in the fact that his classmates experience the same difficulties in deciding on appropriate action.

The opportunity to work as coequal with the attending physicians of Comprehensive Care also gives the student a chance to see that, at times, expert doctors are no more facile than he in making a diagnosis or deciding upon a course of treatment:

My second case was a three-year old girl with a swollen, red, warm left hand, which seemed to itch more than it hurt. No signs of infected wound—only history of a possible insect bite. I felt this was a contact dermatitis. The pediatrician felt it was obvious cellulitis, but insisted we call in a surgeon to confirm him. The surgeon leaned toward my diagnosis—and we called in a dermatologist who felt this was definitely infection—which was very amusing. . . .

Finally, the experimental milieu of the Program also furthers the student's realization that neither his classmates nor his instructors have sure and easy answers to some of the questions he finds puzzling. Because one of the primary aims of the Program is self-critically to develop a more comprehensive type of medical care, students and staff are continuously engaged in a process of inquiry. Conjoined by a living experiment, they openly express their feelings of doubt and uncertainty, and systematically try to resolve them. In one of the weekly Comprehensive Care conferences, for example, we can see this process taking place. A fourth-year student is presenting the history of the Gonzales family, whom he serves as general physician:

The Gonzales family is a Puerto Rican family that has been in this country for sixteen months. It consists of eight members: Mr. Gonzales, a 38-year old unskilled laborer; Mrs. Gonzales, his 25-year old uneducated wife; and their six children. . . . They live in a three-room, unheated apartment on 60th Street. From the outset of our contact with this family, it was obvious that there were a number of interrelated sociological, economic, and medical problems, all of which could not be treated at the same time. We have tried to proceed in the most logical manner, but often our efforts have had to be side-tracked by the appearance of new problems. First, there was the real possibility of the family breaking up under the existing stresses. This immediate crisis passed. Then, there was the problem of tuberculosis with the diagnosis of Anna's active case, the question
of Mrs. Gonzales’ status, and the necessity of evaluating other members of the family. Coincidental with this investigation was the series of upper respiratory infections, otitis media, episodes of gastro-enteritis and pyelitis, Carlo’s seizure disorder, and finally, Mr. Gonzales’ admission to the Hospital. Many of the family are known to be anemic, so following our satisfaction that none of the other children had tuberculosis, it was agreed that the known parasitic infections should be next attacked. . . . It seems certain that poor nutrition is another contributing factor to the anemias, and we have taken steps along this line as well. . . . One of the family’s food difficulties has been the inability to shop properly. Previous to our contact with them, they purchased all of their groceries from a store uptown where Spanish was spoken, and high prices asked. On our advice, Mr. Gonzales now does most of his shopping at the A & P. . . . The situation has been in a constant state of flux since we first came in contact with the family, and shows every evidence of continuing in the same state. . . .

All our efforts still leave many of the major problems of the family unsolved. . . . We will welcome any suggestions and opinions you may have. . . .

A series of student comments followed upon this presentation, gradually crystallizing around one of the major ideas of the Program. (“There is consensus that adequate care must include preventive, emotional, environmental, and familial aspects if it is to offer the most that modern knowledge can supply in the management of those who are ill.” But it has not yet been determined how inclusive “adequate care” can and should be):

I was thinking as I sat there listening to the Gonzales case . . . is it or isn’t it part of the doctor’s job to be concerned with such things as where his patients buy their food?

Theoretically: I guess it’s part of the doctor’s job. . . . But from my own point of view, I’m afraid that if I had a family like this, all I’d want to do is throw up my hands completely. . . .

As far as the question of whether or not the doctor is obligated to look into such matters as the food people buy is concerned, I’d say yes . . . so long as those things pertain to medical illness. And in this particular family, it’s especially important because they’re all anemic. . . . But as for the social problems of this Puerto Rican family, they’re beyond the scope of an everyday doctor to crack, in my opinion. . . .

* From a report of the Comprehensive Care and Teaching Program to the Commonwealth Fund, March 30, 1954.

Training for Uncertainty

What we have here is a group of Americans coming from highly sordid conditions to live in highly sordid conditions. . . . Well, I think it’s part of our responsibility to do something about this problem. . . .

We had another case in a session on Thursday that bears on this. This is an Irish woman who’s tied down with arthritis and who has a number of problems in addition. Among them is the fact that she lives in a one-room flat—dirty and with no heat. Well, the question arose as to whether it’s the doctor’s responsibility to get her another apartment and encourage her to move . . . or whether it’s beyond the scope of the physician’s work. . . .

The variety of opinion voiced in the course of such a conference provides a student with intimations that not only his classmates, but his instructors and physicians in general, are as perplexed as he is by questions about such matters as the boundaries of the doctor’s professional task and the unsolved problems of patients like the Gonzales family. In the words of a faculty member who spoke up at the end of this conference:

These questions don’t only concern students. . . . They concern doctors as well. . . . There just aren’t many “ground rules” in this area. . . .

CONCLUSION

This paper reviews some experiences which acquaint the medical student with the different types of uncertainty he will encounter later as a practicing physician, and some of the ways in which he learns to deal with these uncertainties.

Because this is a preliminary description of what, it turns out, are rather complex processes, we have not organized the analysis around several basic distinctions that could be made. But it seems appropriate to introduce these now so that lines of a more systematic analysis can begin to emerge.

One basic type of uncertainty distinguished at the outset is that deriving from limitations in the current state of medical knowledge. Clearly, the different medical sciences vary in this respect. It has been indicated, for example, that limitations in a field like Pharmacology are now considerably greater than they are in, say, Anatomy. There are comparable differences among the clinical sciences. There would probably be general agreement that gaps
in psychiatric knowledge are considerably greater than those in the field of Obstetrics and Gynecology. Such distinctions would provide a focus for further and more rigorous study of training for uncertainty. The different fields would be arranged according to the degree of uncertainty which characterizes them in order to see whether this ranking is paralleled by what the student learns from his different courses about the uncertainties of medicine. Are students made most aware of uncertainties when they are exposed to fields in which these uncertainties are greatest? More important, perhaps, is the question whether those fields in which limitations of knowledge are particularly prominent offer more or fewer means of coming to terms with uncertainty.

The second type of uncertainty, resulting from imperfect mastery of what is currently known in the various fields of medicine, was not analyzed in terms of its variability. We chose rather to concentrate on the “typical” or “modal” student at different phases of his medical school career. But, obviously, there are significant individual differences, and these could provide a second focus in a more systematic study of training for uncertainty. Students vary in the level of skill which they achieve at any particular stage of their training. For example, those who find it easy to memorize details may have an advantage over their classmates in the study of Anatomy; those whose manual dexterity is highly developed may not experience the same degree of personal inadequacy as the less adroit students when they begin to carry out surgical procedures; extroverted students may find it easier to get along with patients than introverted classmates. These variations in aptitudes, skill, and knowledge may lead to individual differences in the extent to which students experience the uncertainties which derive from limitations of skill and knowledge. Students probably differ also in awareness of their own limitations and in response to these limitations. Some may be more sensitive than others to their real or imagined lack of skill. Some may be more able than others to tolerate the uncertainties of which they are aware. As we have seen, distinctions such as these would have to be considered in a more precise investigation of training for uncertainty. Are relatively skilled students less likely than relatively unskilled students to become aware of those uncertainties that derive from limits on medical knowledge? Are students especially sensitive to the uncertainties which confront them better able than less sensitive classmates to cope with such uncertainties? Or, to raise a somewhat different sort of problem, do students with a low level of tolerance for such uncertainty perform less effectively in their medical studies than students who are able to accommodate themselves to uncertainty? The level of tolerance might also affect the choice of a career: for example, do students who find it difficult to accept the uncertainties which they encounter elect to go into fields of medicine in which there is less likelihood of meeting these uncertainties?

A third distinction involves the experiences through which the student becomes acquainted with the uncertainties of medicine. Some of them are directly comparable with those which a mature physician would encounter. For example, when he meets the tentative and experimental point of view of pharmacologists or when inconsistent findings make a definitive diagnosis problematic, the student is faced with exactly the same sort of uncertainties met by a practicing physician. But other experiences seem to derive their elements of uncertainty from the teaching philosophies or curricular organization of the medical school. For instance, the uncertainties which a student experiences as a result of the avoidance of spoon feeding by the basic science faculty at Cornell or the atomistic division of his class in the third year are by-products of particular conditions in the medical school, although they may have their analogues in actual practice. This distinction would consequently have to be incorporated into a more detailed analysis of training for uncertainty. Which type of experience is more conducive to recognition of the uncertainties in medicine? Which is more easily handled by students? In view of the wide range of experiences in medical school which have a bearing on training for uncertainty, what is the relative balance between those experiences which are inherent in the role of physician and those which inhere in the role of student?

This concluding section is clearly not a summary of what has gone before. Instead, we have chosen this opportunity to make explicit some of the variables and distinctions which were only implicit in earlier pages in order to indicate further problems for the more systematic qualitative analysis of a process like training for uncertainty.