

# The Intellectual Basis of Family Practice

G. Gayle Stephens, M.D.



Winter Publishing Company, Inc. 5740 North Camino Padre Isidoro PO Box 36536 Tucson, AZ 85740

Co-sponsored and distributed by The Society of Teachers of Family Medicine Foundation 1740 West 92nd Street Kansas City, MO 64114

The Intellectual Basis of Family Practice

© 1982 by Winter Publishing Company, Inc. All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. Made in the United States of America. ISBN number 0-938372-01-7.

Production Manager—Anne Olson Book Design/Editing—Lynne M. Harris Original Art—Hector Gonzalez Set in Optima and Kabel Printed by Concept Graphics, Tucson

## CHAPTER 1 The Intellectual Basis of Family Practice

We are still defining the family physician six years after the establishment of the American Board of Family Practice. But a shrewd observer would detect significant shifts in this process over the years. Initially, we were trying to define ourselves to others, such as other specialties, other professional societies, the federal government, and medical school deans. Now, the efforts at definition are largely internally directed. There are enough of us now to exhibit diversity; we are finding that we are not a homogeneous group. As in all reforms, there are revisionists among us, of both reactionary and radical persuasions.

In this paper, I will present some of my reflections about the intellectual and academic base of family practice. Although I cannot expect to resolve all the issues, perhaps I can clarify some of the questions. First, we need to clear away some debris. There are a number of fallacies, delusions, and phony issues which must be exposed and rejected before we can see the real ones.

We should first recognize that none of the certifiable medical specialties were established on epistemological grounds. Most of them sprang up like Topsy and exist by virtue of political, economic, and technological factors that have little to do with a theory of knowledge. Most of them can be classified under the following headings:

- Characteristics of patients (Pediatrics, Obstetrics/Gynecology)
- · Parts of the body (Dermatology, Orthopedics)
- Diseases or conditions (Allergy)
- Techniques of treatment (Surgery, Psychiatry)
- Relation to special machines (Radiology, Clinical Pathology)

None of these represent primary epistemological categories. All of medicine is derivative, secondary, and applied. In this respect, family practice is no more obligated to define itself than internal medicine, pediatrics, or psychiatry. All medical vocations are constantly shifting their territories, and there are many local variations on a theme decided by the political machinations of medical school departmental chairmen or hospital medical staffs.

Phony Issues

So the first bit of debris to discard is our masochistic need to reach a degree of epistemological and intellectual purity that is not only unrealistic but also unnecessary. Let's stop hitting our thumbs with hammers! We should stop trying to solve political problems among medical specialists as though they were knowledge problems. They aren't! And I put all the problems and conflicts related to the performance of technical procedures in this category, whether the issue is surgery, obstetrics, needle biopsy, or cardioversion. All efforts to define family practice or the family physician in terms of technical procedures the physician may or may not perform will fail if approached as a rational problem of knowledge. These are problems of political relationships among professional societies within organized medicine and have more to do with hospitals, lawyers, and insurance companies than with knowledge.

#### A Quartet of Fallacies

The next bit of debris is a quartet of fallacies about the generalist's role and the intellectual challenge of medicine. Webster defines fallacy as "deception" but also as "an argument failing to satisfy the conditions of valid or correct inference." The following are four common but incorrect arguments which have nothing to do with defining a discipline, but which are often used in a discouraging manner.

1. A misunderstanding about omniscience. It is assumed, incorrectly, that a generalist is required to know too much. This takes the conversational form of: "Nobody can know everything"; "I have enough trouble with one field, I don't see how anyone can keep up with several (or all)"; or patronizingly as, "I admire you as a general practitioner. I'm not smart enough to do it."

Each of these statements reveals an assumption that anyone engaged in a field that cuts across disciplinary lines is bound to be intellectually cuckolded by one discipline or another. Those who share this point of view fail to understand the selectivity required by the generalist. Neither the word "general" nor the word "comprehensive" (as applied to health care) imply knowing everything about everything. They do indicate a range of interest and a level of expertise that is broad but not inclusive. One can only guess at the numbers of medical students frightened or shamed out of a generalist career by the fear of omniscience as a requisite.

2. The confusion of information with knowledge. This confusion is usually stated in terms of an overload. There is simply too much to be learned. There are too many books and journals, too many conferences and meetings. Wolf (1974) addressed this problem cogently in an editorial. He quoted a statement from Weiss (1969) as follows:

My assessment clearly disavows the contention that we are in the midst of a "knowledge explosion." The semblance of a knowledge explosion has come from using the wrong yardstick. No doubt there has been a "data explosion," liberally equatable with an "information explosion," although not all of the collected data are truly informative. Furthermore, we are also faced with a "publication explosion." But "knowledge explosion"? Not by criteria of measurement on a scale of relevance. Wolf uses the distinction between growth and obesity as a metaphor for the relation between knowledge and data. Data must be processed by human knowers who place them in relation to other information; i.e., give meaning. The one thing that facts cannot do is speak for themselves.

3. Uncertainty and ambiguity can be eliminated by fragmentation. How many students have succumbed to this most seductive of fallacies that if one reduces the scope of one's field of interest, one can escape uncertainty? In medical practice, this argument takes the form of "How do I feel about myself when I look in the mirror? Am I a good doctor? Am I doing all that can be done for my patients? Is there someone else who can do more and better?" This may become a mistaken rationale for specialization, but problems of identity, confidence, and honesty are rarely settled by changing fields. These are not knowledge problems.

Identifying what can be known completely is unimportant. Pieces of knowledge can never be separated from the whole without a "reductio ad absurdum." All knowledge that keeps its relationship to the whole continues to exhibit ambiguity, uncertainty, and some degree of incomprehensibility.

Cox (1973) has written about specialization in his own field of theology. He sees a belief in fragmentation of knowledge as a way of giving oneself permission to ignore what is presumed to be "outside one's field." It is a "compulsion to master and a tendency to criminal negligence" which never quite works. "Superspecialization," he writes, "is psychologically-and therefore physiologically-pathogenic." It is also politically dangerous, for it leads to an abdication of responsibility for everything outside one's field and, in fact, necessitates hierarchy, bureaucracy, and vertical authority. The superspecialist almost always relinquishes control over how his knowledge will be used. In the Manhattan Project of the 1940s, only those at the top knew what it was all about, and it remained for a nonspecialist to make the political decision about the use of the atomic bomb. These are not arguments against a division of labor or the development of special interests or skills; they are arguments against the notion that certainty is attainable through fragmentation.

4. Knowledge is linear or cumulative. It is a cruel education that allows a student to suppose that he must learn all that was known in the past in addition to what is known now and what must be known for the future, as though these are steadily growing quantifiable sums. The truth is that original thought has a simplifying, clarifying effect. History is replete with examples of how men have debated endlessly while knowing nothing. Intellectual controversies tend to become obsolete and pass away.

This idea has been satirized quite effectively in a book entitled The Saber Tooth Curriculum (Peddiwell, 1939), which recounts the imaginary educational foibles of a paleolithic tribe. The survival skills necessary to this tribe and taught in their schools were: (1) fish-grabbing with the bare hands, (2) woolly-horse clubbing, and (3) saber-toothed tiger scaring with fire. When a new glacial age changed the living conditions of the tribe by muddying their stream, causing the woolly horses to migrate, and giving pneumonia to the tigers, the tribe had to adapt technologically by inventing a fish net, a snare to catch antelopes, and a pit in which to trap ferocious bears. This precipitated an educational crisis. Net making, snare-setting, and pit-digging threatened the old curriculum and a long controversy ensued about what constituted real education. The traditionalists could not give up teaching the old skills, while the radicals wanted to focus exclusively on the new ones.

The refutation of fallacies does not establish the academic role of family practice, but it is a necessary preliminary step because of the persistent nature of the fallacies.

More serious than the fallacies, which are rather easy to expose, are a trio of beliefs so deeply embedded in the intellectual tradition of modern science and modern medicine that they are almost unquestionable. These beliefs have the character of "articles of faith" which support much of the scientific enterprise but, on careful examination, they cannot be shown to satisfy the criteria of the scientific method they supposedly support.

1. To know an object best, one must know it in its smallest dimensions. Under most circumstances, this means that you must take the object apart. In a living system, you have to kill it, so that the philosopher Hans Jonas (1966) says that "the lifeless has become the knowable par excellence." Our knowledge of life is derived from death, a curious paradox to say the least.

2. All complicated systems eventually can be reduced to physics and chemistry. In medicine, this means that sociology is reducible to psychology which is reducible to biology which is reducible to molecular chemistry. This seductive and pervasive belief has recently been challenged by Krebs (1971) in an article entitled, "How the Whole Becomes More than the Sum of Its Parts." Krebs does not turn vitalistic, to be sure, but he does show how the dynamics of macromolecules and enzymes lend characteristics to living systems which are missed when one is preoccupied with the chemistry of elements or simple compounds. Hilary Putman (unpub. ms.), a philosopher of science, has made a more vigorous attack on the reductionist hypothesis, which he terms a fallacy, by asserting that there are categories of human behavior for which molecular biology is simply irrelevant.

3. In principle, all human problems have a technological solution. Medawar (1975) has recently argued this point quite effectively in an editorial entitled, "Some Follies of Prediction," in which he described how people have erred in the past by too easily giving up the search for technological solutions. Many problems thought to be impossible in medicine and surgery have yielded to persistent technological research. These successes, however convincing, do not prove that all problems are of this class. Physicians deal regularly with problems of life or death that require higher levels of abstraction, such as will, motivation, passion, justice, and mercy. These cannot be expected to yield to research in biology; as a matter of fact, some of these problems may even be created by technological advances. latrogenesis has become a major contribution to epidemiology.

A Trio of Delusions

articles of faith

### Adler's Five Conditions

Now let me turn from the negative side of the debate to the positive aspects of developing a foundation for a branch of knowledge and an intellectual discipline. I take my cue from Mortimer Adler (1965), who described criteria for intellectual respectability in any field of study. His particular concern was the field of philosophy, but he stated that the following conditions "are requirements which any mode of inquiry must satisfy to be respectable. They are generic conditions, applicable to all specific branches of knowledge, among which science is only one."

First Condition: The field in question "must be a mode of inquiry that aims at, and results in, the acquisition of knowledge which is characteristically different [from knowledge provided by other fields]." This requirement is not a demand for knowledge in an absolute sense. It is more moderate, calling for knowledge which is (a) testable by reference to evidence, (b) subject to rational criticism, and (c) either corrigible or falsifiable.

Second Condition: The field in question "must be capable of being judged by appropriate criteria of goodness; i.e., criteria of truthfulness, beauty, or usefulness." We must be able to make judgments about relative goodness of data or propositions that emerge from inquiries in the field, and we must be able to subject any such judgments to tests which give evidence for or against. While no knowledge may ever be said to have been completely and finally verified, some knowledge has a higher order of certainty because it has repeatedly resisted efforts to disprove it; i.e., falsify it.

Third Condition: The field in question must "be conducted as a public enterprise." Anyone who wishes to participate in the study of a given field may do so if he is willing to try to answer common questions, to avoid appeals to private information or opinion, to share findings with others, and to subject disagreements to judgment by commonly accepted standards.

Fourth Condition: Not only must the discipline meet the first condition of distinctiveness but it must also have some degree of independence and autonomy. That is, it must have "some questions of its own to answer-questions which it can answer without reference to results obtained by any other discipline. And, on the procedural side, it must have a method of its own for answering whatever questions are proper to it."

Fifth Condition: The field must be concerned about substantial and realistic objects of study; i.e., the natural universe or the human condition. In Adler's terms, the knowledge sought "must be primarily questions about that which is or happens in the world or about what men should do and seek."

It is my contention that family practice education can qualify as a legitimate academic discipline on all five counts. It qualifies not only in a general sense as medical science but also in a special sense as a discipline within medicine.

#### The Distinctiveness of Family Medicine

the quintessential skill of clinical practice and is the area of knowledge unique to family physicians. Lamily physicians know their patients, know their patients' families, know their practices, and know themselves. Their role in the health care process permits them to know these things in a special way denied to all those who do not fulfill this role. The true foundation of family medicine lies in the formalization and transmission of this knowledge. I would now like to try to substantiate these claims.

I want to develop and detend the thesis that patient management is

Each of us who practices medicine has a trail of casualties among our patients which is not the result of neglect, ignorance, or professional malpractice. We have patients whom we did not manage well for a host of reasons having little to do with our knowledge of disease. We have overlooked diagnoses we are perfectly capable of making, overdiagnosed conditions that did not exist, delayed treatment, or overtreated. We have become inappropriately involved with patients who made us angry, became too dependent upon us, or did not follow instructions, and who ultimately got ejected from our practices, either formally or informally, or-ungrateful wretches-died for the wrong reasons. All of us can empathize with the bitter words of the physician quoted below (Houston, 1938):

I suppose that I am particularly bitter about the people whom we may as well call neurotics, who as you say, take up so much of an internist's time. They are the people who drove me out of practice. I never could see any sense in paying any attention to them because... they have neither sense, nor gratitude, nor any idea of cooperation, nor any qualities that might endear them to man, woman, or child.

I cannot understand why those of us who have trained ourselves to take care of people who have organic disease can't be allowed to take care of organic disease. Why won't people take our word for it that there is nothing the matter with them and let it go at that? I suppose I have as many somatic sensations as anybody on earth, but I explain them to myself in a physiological way. Why can't an intelligent neurotic take the same sort of advice that I give myself? There seems to be no way of handling them except that sort of semiquackery that some highly respectable members of our fraternity are able to get away with so successfully.

Let it be clear that, in speaking of patient management, I mean something considerably more comprehensive than treatment. Treatment, whether specific or nonspecific, is only a part of management which, among other things, includes a decision of whether or not to treat and the assumption of responsibility for that decision. I am not limiting the concept of management only to those patients who think they are sick, who fear being sick, or, in some cases, who wish to be sick. What I have in mind are the ideas expressed so convincingly by Tumulty (1973) in his chapter, "What is a Clinician, and What Does He Do?"

Thus, a clinician is not someone whose prime function is to diagnose or to cure illness, for in many cases, he is not able to accomplish either of these.

A clinician is more accurately defined as one whose prime function is to manage a sick person with the purpose of alleviating most effectively the total impact of illness upon that person.

trail of casualties

Before you dismiss me as embarrassingly sentimental or hopelessly anti-intellectual, let me try to be more specific about the types of clinical problems and conditions which require a therapeutic relationship with a physician. Obviously, a great deal of medical care can be provided in a routine, dispassionate way by anonymous doctors to anonymous patients. Much of this can be delegated to co-professionals or allied health persons following diagnostic and treatment protocols. There are particular circumstances, however, which require more. Meyer (1951) wrote about those conditions which the physician cannot treat without knowing the patient's name. This idea has long intrigued me. What does it mean to know the patient's name? At the least, it means acquaintance, but more than that, it means knowing about a patient's life experience, something so unique that only the patient's name can symbolize it. The patient is a "series of one" and his particular biography is clinically important. Whitehorn (1961) wrote about those conditions in which man becomes pathogenic for himself-"a begettor of disease and death." Even if we could magically eliminate all known diseases, physicians would be kept busy with clinical problems arising out of man's individual and group behavior.

The following conditions and complaints seem to me to require the unique managerial skills of a wise and compassionate physician.

- Complaints which are obscure, vague, or undifferentiated.
- Complaints which arise from life-threatening disease.
- Complaints which seem out of proportion to physical or laboratory findings.
- Complaints which are unusual, bizarre, nonphysiologic, or nonanatomical.
- Complaints which are persistent and disabling.
- Complaints associated with marked anxiety or mood change.
- Complaints which result from life change, conflict, or stress.
- Complaints which may require risky diagnostic and therapeutic procedures.
- Complaints arising from conditions which may be managed electively.
- · Conditions which are incurable.
- Conditions involving habits and the lifestyle of the patient.
- · Conditions which require moral or ethical decisions.

All of these require something more on the part of the physician than a "standard operating procedure" or a cookbook approach to diagnosis and therapy.

Patient Management as a Science

Feinstein (1970) asserts that doctors make two basic kinds of clinical decisions, explanatory and managerial. He states, "The explanatory decisions lead to intellectual conclusions about ideas such as diagnosis, and pathogenesis of disease; the managerial decisions lead to therapeutic actions in which the patient is treated to thwart what might happen or to remedy what has occurred."

Explanatory decisions are inferential in character and are supported by our knowledge of the basic medical sciences and by data derived from the clinical laboratory. Managerial decisions, on the other hand, are not nearly so well supported by information from the traditional basic medical sciences. They may require data from "nonmedical" disciplines or even data that have yet to be collected and interpreted. Feinstein further states:

The consequences of this scientific underdevelopment are the massive therapeutic controversies that exist in every branch of medicine and surgery today. There are controversies about such routine daily problems as the best way to treat a cold, set a fracture, relieve a backache, or deliver a baby. And there are controversies about such major dilemmas as the optimal management of diabetes mellitus. The diet, drugs, or surgery to be used for peptic ulcer, the desirability of rigorous treatment for essential hypertension, the value of anticoagulants in myocardial or cerebral infarctions, and the choices of radical surgery versus simple surgery versus radiotherapy versus chemotherapy for cancer... Physicians have developed a splendid clinical science for explanatory decisions, and a magnificent technologic armamentarium of therapy, but our managerial decisions generally continue to be made as doctrinaire dogmas, immersed in dissension and doubt.

Feinstein goes on to list the specific areas in which more information is needed to bolster the reliability and predictability of managerial decisions: (1) observer variability, (2) criteria for interpreting primary data, (3) quantification of prognosis, (4) quantification of therapy, and (5) taxonomies for patients and their clinical management. He suggests that help may be obtained from the fields of linguistics, logic, psychology, statistics, and computer sciences. He deplores the practice of tinkering with medical school curricula merely in order to include the socioeconomic aspects of health care delivery. This is inadequate for the intellectual tasks facing modern medicine. Improving the bases for our managerial decisions is one dimension of patient management which requires an additional intellectual orientation for medical education and provides us with an investigative agenda for the future.

Patient Management as Art Houston (1938) and Balint (1957) discuss another dimension of patient management that has a long and honored history but which has fallen on hard times in recent years. It is the notion that the personal characteristics of the physician and the quality of communication between the patient and the physician are important variables in determining the outcome of patient management. Houston and Balint, whose work and writings are separated by 20 years, arrived at the same conclusion from different perspectives. Houston, writing from the viewpoint of internal medicine, spoke of the "doctor as a therapeutic agent." Balint, from the perspective of a psychoanalyst studying doctor as a drug general practitioners, spoke metaphorically of the doctor as a drug. He states in the introductory chapter of his book, "by far the most frequently used drug in general practice was the doctor himself; i.e., that it was not only the bottle of medicine or the box of pills that mattered but the way that the doctor gave them to his patientin fact, the whole atmosphere in which the drug was given and taken."

Balint goes on to inquire into those situations in which the drug "doctor" does not work or may have undesirable side effects, and his book is an inquiry into the pharmacology of the doctor as therapeutic agent. Houston notes that the placebo has always been a norm of medical practice, yet much more is involved in the use of the placebo than an attitude of expectancy or credulity on the part of the patient. He says, "the doctor's attitude toward the patient is perhaps more fundamental than the patient's attitude toward the doctor.... The faith that heals, heals not through argument but by contagion."

It has become easy in recent times to derogate the physician's role as healer as doctors became a little "heady" with the marvels of biomedical technology. The art of medicine is often seen as a substitute for knowledge and as the stock-in-trade of pretenders and exploiters. I have found medical students, residents, and younger physicians to be quite skeptical about the art of medicine.

I am not defending the art of medicine in a trivial sense as representing courtesy, grace, or style. There is much to be said for these secondary virtues, but they do not reflect the cognitive elements of art. Art is a way of perceiving and representing reality and, in medicine, the art is a way of knowing as well as of feeling. It is an art for the physician to understand the existential dimensions of life, his own as well as those of his patients; and to communicate effectively at the personal level. Medicine not practiced at the personal level is vulnerable to a dimension of evil that can only be called demonic. Witness the separation of art from science which occurred in the Third Reich—euthanasia became training for extermination.

Patient management is the major task of clinical practice, and the skills of patient management are only partly based on education in the natural sciences. The personality of the physician and the relationship that develops between the physician and the patient are important variables in the effectiveness of patient management. It is necessary for the physician to learn how to use himself and his relationships on behalf of his patients.

The art of medicine has never been more important. I am concerned that medicine is moving towards an "objective" therapeutics which is basically technological and which separates the treatment from the therapist. The therapist may thereby become a dispassionate and relatively homogeneous vehicle through which the treatment is given; he may become more a technician than a professional. Recent developments in physician accountability, such as peer review, medical audit, recertification, and litigation against physicians are focused almost entirely on the technical and economic aspects of practice. Most of these developments are inimical to the role of the physician as healer. We are developing an erroneous assumption that health care is a product and that the health problems of the population are remediable by medical technology. These trends could lead to the establishment of a mediocre therapeutics in which the physician's role is progressively deprofessionalized. The physician may thus be separated from primary patient contacts, and his communicative skills could well atrophy as his function is more and more controlled by protocols.

#### objective therapeutics

#### On Teaching and Learning Patient Management

What is required to learn patient management? Certainly a great deal more than an introduction to psychiatry. While psychiatry aids our understanding of human behavior and interpersonal relationships, it is basically a consulting discipline that per se has a rather narrow application to the crucial encounters of clinical medicine. Further, psychiatrists themselves may be infected with the same biases of scientism to which I have already alluded. In addition, they may not have resolved the human issues of practice better than the rest of us. This is not to deny, however, that certain psychiatrists may be of inestimable help to fellow physicians, if a proper format for giving that help can be arranged. There are other professionals who can also help. The critical factor is not academic background but, rather, the personal characteristics of the individual and his experience with sustained therapeutic relationships.

The key to learning patient management is appropriate supervision of the learner's interactions with patients. This may be done in individual or group settings with supervisors. The details of clinical encounters are exposed and reflected upon in a constructive manner over an appropriate period of time. What do the "details" include? Anything that happens between the doctor and the patient: the words of conversation, the behavior of each party, the feelings, the style, and the unspoken assumptions. All of these need to be brought to levels of awareness in a nonthreatening way, so that meaning can be ascribed and tested in the crucible of ongoing clinical relationships.

Each of us brings to medical school, and then to our practice, some intellectual and emotional "baggage." We have notions of what it means to be a doctor, what it means to be a patient, and how these two roles should interact. We have notions of justice, morality, and propriety. We have needs for control, for rewards, and for self-fulfillment that may never have been subjected to critical reflection. We use all this baggage in our clinical practice, and this matrix of personal characteristics in which our scientific information and skill is embedded is often as crucial to the help we are able to give patients as is our scientific information itself. It often determines and limits what we are able to see and hear and what we are willing and able to do. It sets the tone and style of our professional lives in such a way that Balint (1957) refers to it as our "apostolic function"; i.e., our natural, commonsense approach to practice to which we oblige our patients to conform if they want our help.

Now, I am not suggesting that there is some homogeneous ideal to which we all should conform, nor that all physicians need personal psychotherapy. But I am saying that through education of the proper sort, we can broaden the spectrum of people and conditions we are able to deal with effectively. Self-understanding and human communicative skills materially affect the way we practice medicine—our uses of drugs, laboratory tests, x-rays, hospitals, operations, and consultants. In short, they affect how we manage everything—not only our patients and our practices, but our time, our moncy, our families, and our lives.

details of clinical encounters

#### CONCLUSION

This, then, is the intellectual and academic basis for family practice. This is our field for inventiveness and discovery. This is our agenda for research. To be sure, the family physician may borrow a great deal of information and knowledge from other disciplines. Such borrowings constitute a variable and will not be the same in all areas of the country or in all settings. But *the constant is the skill of patient management*. One cannot be a family physician without highly developing this skill. One's bag of technical tricks will change from time to time. One may or may not deliver babies or perform surgery. Whether one does or not depends largely on personal preference and local conditions, but the sine qua non is the knowledge and skill that allows a physician to confront relatively large numbers of unselected patients with unselected conditions, and to carry on therapeutic relationships with patients over time. This is what we should be teaching and learning and practicing. Everything else is secondary.

#### REFERENCES

Adler, M.M. The Conditions of Philosophy. New York: Atheneum, 1965. Balint, M. The Doctor, His Patient and the Illness. New York: International Universities Press, 1957.

Cox, H. The Seduction of the Spirit: The Use and Misuse of People's Religion. New York: Simon & Schuster, 1973.

Feinstein, A.R. "What kind of basic science for clinical medicine?" N. Engl. J. Med. 283:847, 1970.

Houston, W.R. "The doctor himself as a therapeutic agent," Ann. Intern. Med. 11:1416, 1938.

Jonas, H. The Phenomenon of Life. New York: Harper & Row, 1966.

Krebs, H.A. "How the whole becomes more than the sum of its parts," *Perspect. Biol. Med.* 14:448, 1971.

Medawar, P.B. "Some follies of prediction," Hosp. Prac. 10:73, 1975.

Meyer, A. In Collected Papers of Adolph Meyer (E. Winters, ed.) Baltimore: Johns Hopkins Press, 1951.

Peddiwell, J.A. Saber-Tooth Curriculum. New York: McGraw-Hill, 1939.

Tumulty, P.A. The Effective Clinician. Philadelphia: Saunders, 1973.

Weiss, P.A. "Living nature and the knowledge gap," Saturday Review, November 29, 1969.

Whitehom, J.C. "The doctor's image of man," N. Engl. J. Med. 265:301, 1961.

Wolf, S. "The real gap between bench and bedside," N. Engl. J. Med. 290:802, 1974.