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RADIO-TELEPHONE NETWORK PROGRAMS
IN MEDICAL EDUCATION

DISSERTATION
Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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The Ohio State University
1964

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CHAPTER I

STATEMENT OF THE PROBLEM

The problem is to design a study which will provide basic information on an educational method. The method involves three main elements: continuing medical education, FM radio, and the practicing physician. Taken together, these elements serve the following idea. The graduate physician is in need of continuing education. This education should be carried to the home community where it can be efficiently pursued and the learning quickly applied.

In retrospect, a good starting point seems to be to examine this idea from its inception at a specific point in time and in a specific place. As Program Director of WOSU-FM, this investigator was involved from the start in planning and implementation of this idea at the Ohio State University in October of 1961. The possibility of broadcasting two-way radio seminars in medical education for physicians in central Ohio was the subject under initial discussion. At that time there were only two such systems in operation elsewhere, with a third about to begin. Furthermore, there appeared to be little research on the value of this method as an educational tool. Therefore, as a candidate for the Ph.D. in General Communications, this
4. The subject matter communicated is

a) authorized for credit by a professional organization rather than by the university.

b) aimed at the practicing physician in his home community.

c) available to the general public as well.

The initial chapter describes the need for such an educational method, the main objectives for the study and for the Ohio State University project, the background of the Ohio State facility, and its precedents elsewhere.

**Chapter Two** reviews literature germane to radio in education, some pertinent aspects of television, use of two-way audio devices for educational tools, and research which bears on these areas. Descriptive survey design is also considered.

**Chapter Three** gives a detailed account of the initial year's conduct of postgraduate medical education by two-way FM radio-telephone at the Ohio State University. Reviewed are procedures used, some reasons for them, and problems experienced.

**Chapter Four** outlines a plan for an initial assessment of the first year's conduct of the project. The resources are a taped discussion, extensive consultation, and three descriptive surveys in the forms of mail questionnaires. Pollees comprise three groups: (1) moderator-educators at the out-of-town level; (2) practicing physicians who attended one or more programs at their hospitals;
investigator proposed the need for such a study to his adviser in the Department of Speech as well as to key personnel in the Telecommunications Center and the College of Medicine. The proposal met with approval, and the research project was launched.

The study's purpose is to obtain and evaluate information in the following four main areas:

1. Background and problems in the development of this method.
2. Characteristics and limitations on the use of this method.
3. Preliminary indicators of the effectiveness of this method.
4. Recommendations for improvement as a method.

The study is basically descriptive and critical. Little research material is extant which is directly applicable. Too much that exists is peripheral and is made pertinent only by stretching the facts. Excessive extrapolation of irrelevant data may confuse rather than clarify the subject. Several characteristics, however, help define and limit this evaluation:

1. Radio rather than television is emphasized.
2. Open broadcast rather than closed circuit is employed.
3. The two-way flow of information between teacher and learner is an educational goal.
programs at teaching centers. Reasons given, in order of their priority and frequency, were as follows:

1. No one to care for patients while away - 55%
2. Courses given at unsuitable time - 47%
3. Costs involved - 42%
4. Multiplicity of other meetings - 42%
5. Subject matter does not meet needs - 40%
6. Lack of courses in physician's area - 31%
7. Previous unsatisfactory experience with poor courses - 23%
8. Lack of information on courses - 18%

Most germane at this point, however, is the establishment of need for physicians' in-service training.

Dr. Laurence Ellis observed in 1954:

My great uncle attended Harvard Medical School by purchasing a series of course tickets for lectures on pharmacology, materia medica, and so forth. Educators shudder at the quality of that type of undergraduate instruction today, when bedside teaching and learning by doing are the order of things. But how does the modern general practitioner get his instruction? By lectures, usually poorly delivered, at a time of day when both he and the lecturer are nodding with fatigue. Why is the type of instruction that was outmoded fifty years ago for medical students the best for the physician in practice? The answer is that it is not, but that postgraduate education is fifty years behind the times.²

and (3) medical educators from the faculty of the Ohio State University College of Medicine. The questionnaires are designed to provide some data on the values, past and potential, of this method for the learner, the teacher, and the broadcaster. Thus, questions on program elements and procedures as well as content are included in the questionnaires. Moreover, opportunity is given for comments and suggestions which would benefit future programs.

Chapter Five reports, interprets, and analyzes the data collected from the teaching participants; and Chapter Six analyzes similar data from the learning participants. Chapter Seven summarizes the entire study and makes conclusions on the findings. Implications for the future are suggested.

In recent years, medical colleges throughout the country have been expanding their postgraduate activities toward assisting the practicing physician. However, attendance at the sessions has been low. In an effort to ascertain the reasons behind this phenomenon the Council on Medical Education and Hospitals of the American Medical Association conducted a study in which 4,923 physicians were asked to pinpoint factors which they felt to be important interferences with their attending postgraduate

Education commissioned Dr. Abraham Flexner to inspect the medical colleges of the United States. The results of this report\(^4\) were devastating. Nearly one-third of the existing schools immediately closed their doors; and, with few exceptions, those remaining raised admission and teaching standards. Flexner's findings and recommendations set the pattern for the university and the university-like medical center that now exists throughout the United States. Darley notes:

The revolution in medical education that followed the Flexner Report of 1910 was precipitated by the fact that the then-developing body of scientific knowledge was not being translated into medical practice by the then-existing system of medical education. The gap between what was known and what was taught was unnecessarily wide and would have widened further had most of the nation's substandard schools of medicine not gone out of existence and had most of those that remained not bolstered their educational programs by adding qualified medical scientists to their faculties, by introducing research as part of their academic function, and raising their standards of admission and education accordingly.\(^5\)

Now, over fifty years later, medical education has much in common with the era of the Flexner Report. The gap between what is known and what is taught is wider than can be justified--but for different reasons. Instead of suffering from a lack of progress, medical education suffers because of it. This progress has taken place within medicine

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The basis for such a searing indictment is best seen by a brief overview of history. In his foreword to Dryer's study, Dr. Ward Darley indicates that it was not until the early 1800's that the apprenticeship system for training doctors began to give way to the proprietary medical school. These schools were made up of small groups of practicing physicians who joined together and offered lectures on a fee basis to any and all who would pay. Little individual regulation by government or society, especially of business or professional activity, occurred in the turbulent social structure of nineteenth-century United States. True, there were beginnings. The Universities of Pennsylvania, Columbia, Harvard, and Dartmouth had established schools of medicine in the late 1700's. A few others added such schools in the subsequent one hundred years, and Johns Hopkins School of Medicine, established in 1894, became the first to require the baccalaureate degree for admission.

The American Medical Association was organized in 1847 and thirty years later the Association of American Medical Colleges. Both associations had as chief objective the improvement of medical education. By 1910, however, there was scant evidence that such improvement was forthcoming. Therefore, at the behest of the American Medical Association, the Carnegie Foundation for the Advancement of

---

Ruhe lists 1,146 continuing education courses, offered by 208 schools and hospitals in thirty-eight states and the District of Columbia. In 1961-1962 the number was 1,105, and in 1960-1961, 1,116. The states in which the largest numbers of courses are offered are: New York, 305; California, 138; Illinois, 130; Michigan, 73; Pennsylvania, 52; Kansas, 41; and Georgia, 40. The report indicates that as a general rule, the medical schools offer larger, more comprehensive programs, which include a number and variety of courses. However, many community hospitals and private clinics offer only one or two courses during the year.

The course listings are divided among thirty-eight different fields of medicine. The category of General Medicine contains the largest number of courses (116). Psychiatry is next, with 114; followed by Public Health and Preventative Medicine, 111; Ophthalmology, 87; Surgery, 61; and Obstetrics and Gynecology, 55. A total of 360 courses are listed as having thirty hours or more of instruction time. These longer courses are designed to accommodate smaller numbers of students in more detailed coverage of

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7Ibid., p. 486. Fifty-two medical schools account for the 626 medical school courses.
and within society itself. Medical and biological research are now producing a body of knowledge of critical importance. The general public increasingly appreciates the potentialities of medical research and service and is demanding more of both. Consequently the research which is increasing the demand for service is moving ahead of the ability of medicine to develop and maintain the educational programs that can translate and communicate the resulting knowledge into practicable forms.

Discontinuing or slowing research is obviously an unsatisfactory solution. Such would be unrealistic in terms of improvement of quality and quantity of service. Nor can the problems be solved by continuing to increase the time for the basic educational experiences currently required in the medical school and hospital. More subject matter demands more time and the school and hospital years dare not be allowed to cut further into the potential years of professional service. Education must solve this quandary, but the questions of what form, what method, and what content beleaguer members of the medical profession and educators alike. Postgraduate medical educators have turned their sights on these problems with some significant results.

In the eighth annual listing of courses in continuing medical education in the United States covering the period from September 1, 1962, through August 31, 1963,
special areas of medicine. However, the largest groups are attracted to general review courses, lasting three days or less. Reasons for this "short course" popularity are not stated by Ruhe, but he does observe about them: "While admittedly valuable to those who attend, these courses are generally more superficial and more didactic, and do not provide the same degree of individual, personal instruction which is usually seen in the longer courses."  

Presently the Council on Medical Education and Hospitals, which annually compiles the listing of these courses, does not attempt course evaluation and offers no formal accreditation in the field of continuing education. Information included in the annual list is provided by the organizations which give the courses, using regular questionnaire forms supplied by the Council. However, the Council is working to establish a mechanism for formal appraisal and accreditation of all postgraduate programs. Pilot surveys are being carried out to establish the necessary background and experience, under the direction of the Council's Advisory Committee on Continuing Medical Education. The Council hopes these studies will enable formal accreditation to begin sometime in 1964. Such a step seems most advisable. Accreditation has been an important factor in raising and maintaining standards in all areas of education. Applied to medical education, it has been a

8Ibid., p. 487.
means whereby minimum levels of excellence have been formulated and required of all undergraduate medical schools and all institutions conducting internship and residency programs. The structure of periodic survey and review of survey findings by appropriate boards has become well established, enabling prospective physicians to pursue their training with confidence in the quality of educational standards.

Such has not been true for the physician in practice:

No such assurance has been possible for the physician who wishes to continue his education. It is entirely possible that he might take time off from his practice, travel a considerable distance, and pay a large fee to take a postgraduate course, only to find that it has been largely a waste of his time and money. Not only is this a loss itself, but it is also likely to kill his enthusiasm for further formal study.\(^9\)

Within the past ten years some of the shortcomings of continuing education in medicine have been demonstrated by research. An analytical study of North Carolina's general practice was done by Peterson and associates.\(^{10}\) In the survey by Vollan for the American Medical Association, it was found that only a minority of physicians keep in touch with advances in medicine through continued medical

\(^9\) Ibid.

He found that physicians vary considerably in their use of postgraduate opportunities—from one-third who reported no attendance in the last five years, to one-sixth who attended an average of more than one course a year. There remains a significant group who are in great need of postgraduate medical education, but who do not seek it. As mentioned early in this present study, the fact that the physician often has no one to care for his patients while he is away seems to be the most important deterrent to his use of postgraduate opportunities.

It is not clear to what degree the quality and techniques of postgraduate education are responsible for the physician's apparent lack of motivation mentioned earlier. Some general criticisms crop up frequently throughout the literature. Sometimes a program is designed without identifying the specific audience for which it is intended and without proper representation of the learner-physician at the planning stage. If the teacher has not been made aware of the kind of physician-audience he is to address, he cannot use his knowledge to best advantage or select the educational methods best suited for the occasion. Programs also suffer when financing is inadequate. Lack of learner participation is a critical weakness often commented upon. Lectures, panel discussions, seminars, motion pictures, and exhibits all too often offer the learner only a passive experience.

13Vollan, op. cit.
education. Up to now, there has been little success in reaching individual physicians who have long been in practice and who have lost contact with modern medical advances. The problem also extends to younger physicians; since, as Vollan estimates, one-third of the members of current graduating classes do not undertake any sort of continuing education. The needs of practicing physicians and understanding the reasons why so many do not take advantage of opportunities for continuing education constitutes a major problem.

Peterson and his associates, using direct observation of medical practices, came to the following tentative conclusions. Among physicians who were performing poorly, many appeared to be lacking in a comprehensive grasp of clinical skills. The study also indicates that advancing age was in general associated with lower quality of work, less postgraduate study, and a smaller patient load. Yet, in spite of this trend, some of the older physicians showed a notable keenness and interest in recent advances. Finally, Peterson was unable to document the influence of postgraduate study on a physician's performance, but his data suggest a reappraisal of the methods employed in postgraduate education is urgently needed.

Vollan, in his national survey, came to similar

11 Vollan, op. cit.

12 Peterson, op. cit.
that the physician may be tempted to accept these "answers" without inquiring into them or considering alternatives. And it must be acknowledged the pharmaceutical firms which circulate promotional material as professional education, study thoroughly the habits, preferences, and problems of physicians as well as making available records of patient diagnosis and treatment.

In the study referred to earlier, Dryer points out: "As far back as 1848, the Committee on Medical Sciences stated that it had reviewed all the journals appearing in the previous year and that there was 'too much literature.'" As early as 1945, Vannevar Bush observed:

Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for that purpose...The difficulty seems to be, not so much that we publish unduly in view of the extent and variety of present-day interests, but rather that publication has extended far beyond our present ability to make real use of the records.

The recently published 1958-1962 report of the Institute for the Advancement of Medical Communication corroborates the complexity of today's situation.


17 Institute for Advancement of Medical Communication, 1958-1962, Bethesda, Maryland (Uniondale, New York: Salisbury Printers).
Opportunities for bedside teaching, conferences, and courses in which the physician actually participate are few.

Voluntary health agencies have served mainly to make available to physicians concise, so-called "authoritative" information in the form of pamphlets and/or brief monographs. It must be stated here such agencies also support scientific medical journals. Nevertheless, although the aforementioned concise publications are aimed at helping the physician to understand and use new knowledge, they do not always accomplish these purposes. In fact, many practicing doctors feel they are drowning in the waves of non-discriminatory new information.

Moreover, the phenomenon has arisen where the pharmaceutical firms, industry, and government have taken to educating the physician. C. D. May\textsuperscript{14} has revealed the seriousness of a situation in which industry invests almost four times the combined budgets of existing medical schools in "educational" efforts. The pharmaceutical firms have recognized the swelling informational tide in which the general practitioner finds himself, and are attempting to supply him with what he thinks he needs in palatable, readily assimilated form. The drug "detail" men stand ready to fill in gaps in information. The unfortunate result is

The basic objective of this study then is to ascertain, as an initial preliminary assessment, whether or not the Ohio Medical Education Network in its first year demonstrates an effective device for dealing with these problems.

Development of this Ohio State program began in October of 1961, with a conversation between Dr. Prior, Director of the recently-formed Center for Postgraduate Medical Education, and the Program Director for Radio at the University Telecommunications Center. At that time, Dr. Prior wished to investigate the possibility for setting up a system similar to that currently in operation at Albany Medical College in New York which made use of the facilities of the college FM station, WAMC. The main characteristics of the Albany plan are pertinent at this point.

On December 5, 1955, Albany Medical College initiated an attempt at partial solution of the problem. Under the directorship of Dr. Frank M. Woolsey, Jr., Associate Dean, the Department of Postgraduate Medicine conducted the first successful two-way radio medical conference. This and subsequent conferences were made possible through the efforts of a group of amateur radio operators, some of whom were associated with the medical college. The first phase of this experiment was financed by a grant of $4,000 from the Rockefeller Foundation, and a shortwave transmitter with a maximum power allowed (1000 watts) was constructed.

Education by the Committee on Professional Education of the American Heart Association (New York, 1961), p. 10.
Robertson is finding in a four-year study, as yet unpublished, a wide disparity between the line space in medical journals devoted to certain topics and the percentage of actual need for such information in the physician's actual practice.

Such findings do not warrant wholesale condemnation of printed material as a tool of education. Nor do they inveigh against the distribution of information as such. However, they do point up a need for reexamination of educational goals and methods, with a more careful eye to the practicing physician's situation and needs, and a better understanding and acceptance of what the results of the "communications explosion" can mean to meeting the problems. In The Physician's Continuing Education, the Committee on Professional Education of the American Heart Association concluded:

Undue emphasis has been placed on the goal of 'bringing new information to the physician.' It is more important to help him cultivate his analytical ability and improve his critical judgment. To accomplish this, he should have opportunities actually to work in the learning situation, since we learn relatively little from what we hear, more from what we see, but most from what we do.

18 W. O. Robertson, "An Appraisal of Pediatric Communication, Phase I," (Abstract), American Journal of Diseased Children, CII:583 (October, 1961). Dr. Robertson is the former Director of Children's Hospital, Columbus, Ohio, and Professor of Pediatrics at The Ohio State University.

19 "The Physician's Continuing Education," Report of the Status and Objectives of Postgraduate Medical
and installed. On the days of a conference, an amateur radio operator would take a transmitter, receiver, and antenna to a participating hospital and man it for the conference hour from 12:00 noon to 1:00 p.m. During this hour, two or more members of the Albany Medical College would deliver short lectures in a twenty-minute period on a pre-determined medical subject. The remainder of the hour was then used to answer questions on the subject asked via short-wave radio by the physicians assembled at the various outlying hospitals. The charter group was made up of six hospitals within a radius of fifty air miles from Albany. By January, 1958, the number of hospitals had grown to twenty-two.

In 1958 through an additional grant from the Rockefeller Foundation, Albany Medical College became the first medical college to own and operate an educational FM radio station (WAMC, 10 kw at 90.3 megacycles). This development brought with it an added responsibility: use of the public air waves. Where before the conferences involved only short-wave transmission and reception, they would now involve the band of the spectrum, known as frequency modulation, or FM. With the greater advantages of distribution came the social responsibilities of broadcasting. Thus, applications for remote broadcast pickup transmitters in the 153 megacycle band were filed with the Federal Communications Commission. Upon receiving these
licenses, remote broadcast pickup transmitters and FM tuners or receivers were purchased for use in each of the participating hospitals.

February of 1958 saw the first usage of the above-mentioned facilities for the two-way medical conferences. The WAMC transmitter was installed at the top of Mount Greylock,\textsuperscript{20} the highest mountain in Massachusetts, and some forty air miles from Albany. Directional antennae were used at the hospitals for the remote transmitters, the emanations therefrom being beamed to Mount Greylock and simulcast on 90.3 megacycles. In a similar manner a studio transmitter link on 940 megacycles sent voices from the Albany College studio to the mountain top. Anything transmitted from either an outlying hospital or from the Albany studio could be heard by anyone with an FM receiver capable of receiving the broadcast signal from WAMC.

From such a base in 1958 to date, the Albany setup has undergone considerable extension, some modifications, and some diversification to other areas of education. November of 1958 saw a grant from E. R. Squibb and Sons, a division of Olin Mathieson Chemical Corporation, which fostered remote facilities in Boston, Massachusetts, Burlington, Vermont, and New Haven, Connecticut. Such expansion permitted the teaching load, previously carried alone by the Albany faculty, to be shared by the faculties of the medical

\textsuperscript{20}3500 feet above sea level.
half-hour broadcast on open circuit television, followed immediately by a one hour, two-way radio conference with the same panel and hospitals participating.

Growth of the Albany system has been healthy. Average total attendance for each of the first three conference years (1955-1958) was 3,976. By 1961-1962, attendance reached 11,022, representing 9,795 attendances by physicians and 1,227 by other staff members (nurses and technicians). The actual number of individual physicians registered was 1,298. In 1963-1964, the Albany system will be serving a total of fifty-eight hospitals. Such growth has been facilitated by grants from a number of firms and associations, and by increased broadcast participation by educational and commercial radio stations.

It will have been observed that considerable time has been spent on the characteristics and development of this program at Albany Medical College. This is done because Albany was the pioneer in this venture and did serve as the prototype for the Ohio State University system. Thus brief references to similar programs in Philadelphia or North Carolina will need only be made where similarities or differences would apply to this study.

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22 The Merck Sharp & Dohme Postgraduate Program: Heart Association of Albany County; New York State Division of the American Cancer Society; The Academy of Medicine of New Jersey, and others.

23 WGBH, Boston; WCFR, Amherst, Massachusetts; WBMI, Meriden, Connecticut; and others.
schools at Boston University, Harvard, Tufts, the University of Vermont, and Yale. Here then was a communications structure where physicians could question outstanding medical educators from these six medical colleges without the necessity of the doctor leaving his hospital or the educator leaving his campus.

Management of the conference programs was improved by the addition to the system of what Albert Fredette, Station Manager of WAMC, affectionately refers to as an "electronic hand-raiser." This device consists of tone transmitters at the remote locations and tone receivers at the radio station studio control room. When the alerting button is pressed at the participating hospital, a light goes on, indicating to the medical moderator at the studio that there is a hospital group which has a question and also indicating which hospital group it is. Continuity and classroom-like order were thus enhanced.

Moreover, visual aids were considered essential. Mimeographed charts, graphs, and outlines were supplied to the physician upon arrival at the hospital prior to the conference. And duplicate slides were distributed ahead of broadcast to each hospital to be shown on cue with the lecture portions. Cross-media visual experimentation has taken place. One program was produced with the first

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In 1959, the Pennsylvania Hospital Continuation Education program in Philadelphia initiated a series of radio seminars. These were under the direction of Fred MacD. Richardson. As of 1962, this network included fourteen hospitals. In correspondence with this investigator, Dr. Richardson outlined the characteristics of the Pennsylvania operation as follows:

Our return transmission from remote participating points is by Schedule D lines of the telephone company leased for that purpose. Frank's Albany plan is by short wave mobile unit radio. We tried to use these but our antenna height was not enough to give us the required line of sight for anything more than about forty miles away. We also use primarily one faculty member on the tapes (he speaks approximately 24 minutes). We also have fewer participating groups per day than does Frank and I prefer this because it gives a chance for better back and forth communication rather than a simple question and answer relationship. We sometimes have some pretty good discussions generated over the radio. Another difference is that our moderator (me) gets into the act more than is customary in Frank's programs. This, in general, leads to a more relaxed atmosphere of the program and may or may not be good, but again it contributes to more back and forth rather than a simple posing question and giving the answer which may or may not always satisfy the questioner.

The seminars are broadcast twice a week between twelve and one o'clock on Tuesdays and Thursdays over WHYY-FM, and Thursdays only, over WFNZ, WPPA, and WHP.

Dr. Richardson, in cooperation with the National Board of Medical Examiners, attempted to evaluate the effectiveness of these programs. A description of this study will be covered in the next chapter on the Review of Literature.
In 1961, Dr. William P. Richardson, Assistant Dean for Continuation Education, and colleagues at the University of North Carolina School of Medicine inaugurated a series of two-way radio FM conferences which involved nine groups of physicians meeting in hospitals within a one hundred mile radius of the WUNC radio station at Chapel Hill. The following excerpt is taken from the announcement letter which was distributed to all physicians in the area:

It is with a great deal of pleasure that I announce the inauguration by the University of North Carolina of a new kind of medical postgraduate program. The new program, which is supported in part by a grant-in-aid from Merck, Sharp and Dohme [pharmaceutical company], involves the use of FM radio for broadcasting educational programs to physicians meeting as organized groups in local hospitals, with provision being made for these groups to ask questions of the speakers through a conference telephone hook-up.

We plan to give twenty-four weekly programs this year, to be broadcast on Tuesdays from 1:00 to 2:00 p.m. They will consist of a thirty-minute presentation and thirty minutes of questions and discussion. While only those in the organized groups can submit questions, any physician who lives within the effective range of WUNC-FM (around 100 miles) and who has an FM receiver can tune in and listen. WUNC-FM will be found at 91.5 megacycles on the FM dial.

There will be sequences of three or four programs on related subjects, and they will be designed to be of interest to all physicians. Participants will include invited guests from within and without the state as well as members of our own faculty.

A tenth group of physicians was added to the network for the 1962-1963 series. No known systematic appraisal of the effectiveness of the North Carolina network has been made.
As indicated earlier, planning at Ohio State began in October of 1961. Previous to October, Dr. Prior had discussed the problem with the Ohio Bell Telephone Company based on the possibility that a radio network similar to that of Albany might not be attainable. The resulting phone hook-up would have been closed circuit unless one or more radio stations were to tie in and then broadcast the entire phoned conference. The quality would not, however, have been good broadcast quality. Without broadcast the conferences could not reach the general public or physicians unable to register and attend a hospital. More will be said about this later.

Following this initial meeting, the WOSU staff researched the possibilities of establishing the two-way FM radio network. By December 28, 1961, such a plan was ruled not feasible due, in the main, to geographical circumstance and problems adjacent thereto. The crux of the difficulty lay in the low power, high frequency transmitters to be located in the hospitals in outlying areas of central Ohio. Where WAMC at Albany could receive from a radius of 150 miles due to tower height and mountain top location, the signal to WOSU-FM would be unreliable over fifty miles away. This problem promoted suggestion of a two-line loop network, using Class D (broadcast quality) telephone lines.

24 See Appendix A, p. 150.
As reported to Richard B. Hull, Director of the Ohio State University Telecommunications Center, on March 12, 1962, this proposal had some advantages, among which were the following: low cost, little maintenance, no distance limit, no FCC licensing, and reliable quality.25 Despite these advantages, however, such a network had a number of drawbacks, not the least of which was maximal exposure to the general public.

From this point on, events moved swiftly. On April 3, 4, and 6, 1962, WOSU-FM originated a program for the Albany Medical Network on "Ulcerogenic Tumors of the Pancreas and Management of Pancreatitis." This program was carried on lines to and from WAMC at Albany, for broadcast to a different group of hospitals on each of the three days.26 Two of the three days, WOSU broadcast the programs as an experiment.

On hand in addition to the two authorities from the College of Medicine at the Ohio State University were Dr. Frank M. Woolsey and Albert Fredette of the Albany Medical College. Discussions with them, added to further information gleaned from Dr. John Prior, Ohio Bell Telephone, and other broadcasters led to the conclusion that a "hybrid" system would best meet the needs of the Ohio situation. This would be a combination of broadcast and phone line

25 See Appendix A, p. 151. 26 See Appendix A, p. 152.
facilities. By April 16, the plan was formulated with the following characteristics: (1) Each receiving point would be equipped with an FM receiver capable of receiving WOSU-FM. (2) Each participating hospital would have a good quality microphone and broadcast pre-amplifier with specifications to be drawn by Mr. Boggioni, WOSU Chief Engineer. (3) WOSU-FM (89.7 megacycles) would broadcast the presentation: the participants' statements, incoming questions and answers. (4) The Ohio Bell Telephone Company would provide, at regular Class D rates, audio lines from the receiving points to the WOSU-FM studio. Financial estimates were included in this plan but do not seem pertinent at this point. The plan was put into action.

By June 14, a Dayton, Ohio, radio station, WHIO-FM, had agreed to rebroadcast the programs from WOSU-FM, thereby servicing four participating hospitals in the Dayton area as well as one in Piqua. By June 27, ten hospitals who were to participate in the network in 1962-1963 were committed. The eventual number was twelve hospitals in eight cities. Throughout the summer, activity consisted of general preparation, purchasing, installation, and testing. By August 21, a plan had been finalized with the hospitals and WHIO-FM for a "dry run" of a typical program, with the date set for

October 3 at twelve midnight.\textsuperscript{30} This date was but two weeks away from the target date of the first program of thirteen broadcasts in the first year's schedule, which ran from October 17, 1962, to April 10, 1963.

The "dry run" was more than satisfactory. The series was carried and completed, and from all outward appearances, was a happy success. It was time to take stock. Some evaluation was needed. Some questions needed answering. What were some goals? Were they achieved? Where were the successes and failures? How effective was this method against other alternatives? If this method has succeeded, how can its success be improved? What other areas of educational need might be served by the same or similar technique? Some answers to these and other questions will be sought in later portions of this study.

\textsuperscript{30}See Appendix A, p. 158.

Selection of the midnight to 1:00 a.m. on-air rehearsal was for the following reasons: (1) both WOSU-FM and WHIO-FM were free of regular program commitments; (2) hospitals participating could arrange such a session more conveniently; and (3) format of time for the program elements would coincide, e.g., twelve midnight and twelve noon.
WEAF for a course on the interpretation of Robert Browning, and two hour college debates were broadcast in 1925. Not until 1928 did NBC launch the renowned music appreciation hour with Dr. Walter Damrosch. 1929 saw the initiation of the Ohio School of the Air under the guidance of Ben Darrow, followed in 1930 by the CBS School of the Air. It was also in 1930 that the Institute for Education by Radio was established under the supervision of Dr. W. W. Charters at the Ohio State University as a conference where broadcast education and its implications could be discussed. Twenty years later at this Institute, H. V. Kaltenborn raised a question which had persisted, and still persists today:

...do the people really want adult education by radio? The commercial pollsters produced charts, diagrams and statistics which proved conclusively that no one wanted education on the air.²

Nonetheless, other evidences of educational efforts by radio exist; and although the schools of the air such as the Wisconsin School of the Air and others, have been aimed at school classroom enrichment, the adult emphasis has been present too. Agricultural Extension services at various institutions sought to make use of radio as an educational tool. An experiment in 1932 at the Ohio State University is worthy of some special note since it contains elements similar to the present project. This experiment was one

²H. V. Kaltenborn, "After 20 Years, What Lies Ahead?" Education on the Air (Columbus, Ohio: O. Joe Olson, The Ohio State University, 1950), p. 417.
CHAPTER II

REVIEW OF LITERATURE

In reviewing some of the literature pertinent to this study, it is essential to establish a general setting. Radio has been linked with education from its very inception. In its application specifically to the medical profession, the following words appear in a volume copyrighted just ten years after the birth of radio.

Although radio has unfortunately been the basis for much of the recent medical quackery, and 'radio doctors' have sprung up in large numbers throughout the land, the fact remains that in diagnosis as well as in treatment radio technique may yet play an important role. No less an authority than Dr. George W. Crile of Cleveland has formulated a theory of the electrical nature of life and it may be that in time radio technique will serve the legitimate doctor in good measure.¹

Radio was viewed as a great potential tool for education in the classroom and for adults. In 1920 the University of Minnesota initiated a course over station KUOM in Esperanto. In June, 1923, station KHJ of Los Angeles broadcast a series of lectures on Astronomy. In the fall of 1923, Columbia University made use of the facilities of station

which sought to coordinate extension meetings with radio talks. Pictures were projected before the audiences and synchronized with the radio talks at five county meetings. This was made possible through the facilities of station WOSU (then WEAO). WOSU had cooperated with the United States Department of Agriculture since 1927 in broadcasting information prepared for radio by that agency.  

The depression gave education by radio a considerable stimulus at the Ohio State University. While on the one hand, station WEAO suffered from depleted funds, it nevertheless experienced a multitude of new demands for service. Out of such a situation came the Radio Junior College, first presented on the air in January of 1934. Frost observes:

Created as an emergency project it has been partially financed by government aid. Three successive agencies furnished money for assistance in printing and distribution costs: the Civil Works Administration, the Federal Emergency Relief Administration, and the Works Progress Administration. The university provides the radio station, instructors from the regular faculty, and working facilities, while the federal agencies, the clerical and field workers, drawn from the ranks of the unemployed.

Although federal support of this project was limited to a three-year period, the tradition of offering extension

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education continued. Atkinson\textsuperscript{5} indicates that from the winter quarter of 1934 through the spring quarter of 1941 there had been 173 courses offered, with a total enrollment of 42,091. While a form of credit was offered earlier in these courses, in later years even the practice of asking for enrollments was dropped. Courses covered subjects of language, science, social studies, nursing, home economics, agriculture, and art.

Generally, educational broadcasters have been and still are concerned with informal cultural radio broadcasting. Various emphases have been placed on serious music. Documentary programs, historical and social analyses and informal coursework programs by educational radio have been fairly constant to the present day.

Television brought a whole new era. With the addition of the visual medium to sound, once again authorities hailed the advent of new horizons for education. Beginning in the early 1950's, educational television, both open broadcast and closed circuit, grew rapidly, until today there exist over seventy educational television stations in the United States and almost countless closed circuit adaptations for teaching, monitoring, and information-gathering in operation. Comparisons were inevitable.

A study conducted in 1959 by the University of

\textsuperscript{5}Carroll Atkinson, Radio Extension Courses Broadcast for Credit (Boston: Medor Publishing Company, 1941), p. 26 ff.
Wisconsin TV Laboratory in the Wisconsin School of the Air with the assistance of a grant-in-aid from the Educational Television and Radio Center, Ann Arbor, Michigan, compared the teaching effectiveness of radio and television. This experiment sought to compare relative effectiveness of equivalent radio and television versions of a series of experimental programs for second-grade children. Two similar and equivalent sets of students took part in the experiment. Classroom groups were randomly divided and assigned to the radio or television treatment. The television groups obtained significantly higher scores on the radio group in immediate recall test of their factual knowledge. The television group's score on a delayed recall test six weeks after the last program still was higher than the radio group, but the difference was no longer significant.

Other studies exist on this particular problem, however, additional detailed comparisons of effectiveness between television and radio do not lead to helpful conclusions regarding two-way audio communication in the educational process. Thus, further investigation is considered beyond the scope of this study.

The use of two-way audio-educational tools in or out

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of the classroom is divided into two main categories: (1) those used in conjunction with television and (2) those used as the single medium of communication.

In the former category one of the most frequently suggested means for providing for students' questions in televised courses has been to use microphones in the classrooms enabling students to signal the instructor and ask questions. Pennsylvania State University at one time had six of its television classrooms equipped with such microphones. The effects on students' performance of being able to ask questions over the two-way communication system were evaluated in two different courses, namely Air Science and Principles of Economics. In each course the performance of students in microphone-equipped rooms was compared with students in rooms not so equipped. In both cases, the opportunity to ask questions had no significant effect on student performance. Students in all of the groups could hear the questions asked and instructors' replies. Nevertheless, students liked having the two-way system available.

Carpenter and Greenhill measured factors of studio or classroom, group size, proctors, and intercommunications. They found no significant differences between size of the viewing group, location of the viewing group, amount of proctoring, or supervision. Success in the use of a talk-back

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system was offset by loss due to the number of trivial and irrelevant questions.

In a more recent development, the University of Akron has incorporated a talk-back system in its instructional television installation, which began operation in 1961. Sibila and Mavrides indicate this facility:

...permits students to ask questions directly of a TV instructor while lectures are in progress. Requirements which this system had to include:
1. The student should not have to leave his seat to ask a question; (2) No microphone should be passed around the room; and (3) All other rooms viewing the lecture should simultaneously hear the question.8

Under this arrangement, if a student wishes to ask a question of a teacher in the studio, he lets this be known to a proctor in his classroom. The proctor then presses a switch located near the front of the room. This switch operates a buzzer and a panel light corresponding to the specific room from which the question is to originate.

When the instructor is ready for the question, he verbally indicates his readiness and depresses a switch on his console which corresponds to the classroom. The audio circuit has been structured so that the original question is then heard both in the studio by the instructor and in all viewing classrooms. This eliminates the necessity for repeating questions.

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Although forty courses have been taught in full, or in part, to nearly 13,000 University of Akron class registrants since February of 1961, no known research exists which isolates or measures the significance of this talk-back system in the televised instruction.

Specifically in the area of continuing medical education, a form of two-way exchange of information exists in Florida. Michael⁹ has described a type of presentation where three local physicians serve as half of a panel and are in the studios of station WJCT in Jacksonville. The other half of the panel is made up of several of the medical faculty of the University of Florida who are located in the studios of WRUF-TV in Gainesville. A micro-wave relay, part of Florida's educational television system, permits exchange of questions and answers following a case presentation in the Jacksonville studio, by switching sound and picture between stations as is done with news documentaries. Michael observes: "The idea of this type of presentation is to 'bring' the University to the 'bedside teaching' in Jacksonville, some sixty-five miles away."¹⁰

However, this exchange is beneficial from a participation viewpoint only to the two halves of the panel. The


¹⁰Ibid., p. 262.
medical topic, followed by thirty minutes of questions and answers. The questions are telephoned to the panel at the central ETV studios in Columbia. Groom has written of the disadvantages of this system:

The lack of color in the telecasts has not proved to be a serious drawback. Although a few technical problems have arisen, they have chiefly been due to improper adjustments or tuning of the classroom receivers and these instances have been rare. More serious is the problem posed by the question-and-answer feature of the telecasts: the logistical difficulty of placing and receiving calls from a large number of communities and of transcribing, interpreting, and organizing questions in a thirty-minute period, can be severe. By experimentation a more expeditious method of handling programs is being evolved. A second major problem has been that of organization at the local level, including arrangements with school authorities for opening classrooms at designated evening hours and for access to telephones.  

The abovementioned disadvantages, as well as the advantages apparent in the South Carolina operation would bear further investigation were they likely to contribute data pertinent to this study. However, together with the other examples of two-way audio educational tools used with television, they do not focus specifically enough on the problem at hand. More germane is an examination of the second category mentioned earlier: namely, two-way audio educational tools used as the single medium of communication.

13Dale Groom, M.D., "Postgraduate Medical Education by TV in South Carolina," Educational Television, Southern Regional Education Board (Special ed.; Atlanta, Georgia: April, 1963), pp. 8-9.
audience of practicing physicians can only view and absorb. At the University of Utah, Castle has noted:

A serious shortcoming of television teaching is the passive role in which it places the learner. This can be overcome to some degree by use of two-way communication devices such as postal service, telephone and two-way radio systems and reinforcement devices such as syllabi, tests, etc.\footnote{C. Hilmon Castle, M.D., F.A.C.P., "Open Circuit Television in Postgraduate Medical Education," \textit{Journal of Medical Education}, XXXVIII, No. 4 (April, 1963), p. 259.}

Thus, Castle reveals a two-way FM radio system to connect the University of Utah College of Medicine with all hospitals in the KUED (Salt Lake City) viewing area is being planned.

It is hoped that this addition will make the practitioner an active participant in the clinics and allow him to contribute his knowledge to other practitioners in the area. The two-way radio system not only will be used to supplement the TV clinics but will serve as an independent means for instruction.\footnote{Ibid., p. 256.}

Another example of an attempt to gain two-way participation in conjunction with televised medical education exists in South Carolina. Since November of 1961, the medical college of South Carolina has been using the state-wide closed circuit educational television facilities for postgraduate courses for practicing physicians. The schedule is set for once a month and held at night. The physicians attend their own local school outlet. Each program consists of a one hour televised panel discussion on a specific
In 1954, Van Kleeck reported on the problems and applications of this technique. Questions of sufficiency of home-bound instruction, proper use, supplementation of visual aids, teacher effectiveness, and costs are evaluated. Says Van Kleeck:

Some 29 states with programs of special education for handicapped children now approve this method for partial or full state aid repayment. Often service clubs, P.T.A.'s and social service organizations help pay part of the cost.

Hill has shown this technique to have originated in 1940 in Iowa. As Educational Director of United Cerebral Palsy, Hill reports the results of an inquiry to 135 schools then using school-to-home telephone as a supplement to conventional homebound instruction. Also queried were directors of special education. The main aim was to isolate the use of this technique for cerebral palsied victims and thus the findings have little direct application to the present study. However, unsolicited responses from the total of ninety-eight received had a

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14 Edwin R. Van Kleeck, "Special Education's 'Forgotten Child,'" The Nation's Schools, LIV, No. 4 (October, 1954), pp. 52-54.

15 Ibid., p. 54.

This category may be sub-divided into three general types: (1) closed circuit telephone, (2) limited broadcast, and (3) open broadcast. Type 1 is exemplified by a system variously known as "teaching by telephone," "instruction for the home-bound child," and other catch phrases. However, a basic description will suffice here. By this means an ill student can hear his teacher ask questions and participate in class and group discussions. His words are audible to his teacher and fellow students.

A portable speaker-microphone unit in the classroom transmits by telephone wire every spoken word to the student's home or hospital room. The ill student can follow his class around the school if a portable classroom unit is transported and plugged into pre-wired outlets. This may be an application to some high school, college, and graduate school situations.

The equipment consists of the student's home station, which is a speaker-microphone and amplifier with a "listen and talk" switch, and a school amplifier, which provides amplification of the home-bound student's voice. One school amplifier can usually serve several home stations. The third item is a portable classroom station, which is a combination speaker-microphone. This is usually mounted at the head of the classroom. It may be unplugged and carried to each classroom. Leased telephone lines connect the basic equipment between home or hospital and the school.
...not every homebound child can derive optimum benefit from the system; each case must be painstakingly evaluated before a decision is made to install the telephone equipment.\textsuperscript{17}

An up-to-date manual on the teaching by telephone technique has been written by J. A. Richards,\textsuperscript{18} Educational Director of Executone, Incorporated, the firm which supplied the equipment needed by home and school.

Despite the greatly increased availability of certain forms of educational television and radio, the teach-by-telephone technique seems to be meeting a specific need for students-to-school contact. In his foreword to Richards' manual, Dr. George B. Brain, Superintendent of Schools in Baltimore, Maryland, asserts:

The social contacts of the class group are an invaluable part of the learning situation for the shut-in child, as they are for all children. The opportunity to communicate directly with classmates afforded by the School-to-Home method is something no visiting teacher, no matter how expert, can bring into the home on his occasional visits.\textsuperscript{19}

The major application of the foregoing method seems to be public school education, although, as mentioned, the device may be adapted to college and graduate needs. However, another example of two-way audio tools for education

\textsuperscript{17}Ibid., p. 3.

\textsuperscript{18}J. A. Richards, \textit{How to Teach Shut-In Students by Telephone} (2d ed.; New York: Special Education Division, Executone, Inc., June, 1960).

\textsuperscript{19}Ibid., p. 1.
is typified by the Tele-Lecture process, a recent service of the Bell Telephone Company, which has as its basic principle of operation the bringing together of teacher and students by amplified long distance telephone. The President of the University of Omaha has written of the use of this development.  

Since 1960 the University of Omaha has experimented with this process. On one occasion Elizabethan scholars in London and at Cornell lectured to a class at University of Omaha, and this was shared with audiences at three other schools: Drake University, Midland College at Fremont, Nebraska, and Wayne State at Wayne, Nebraska. A program chairman, a panel group or members of the audience may participate in the discussion through such devices as roving microphones. Pictures of the speaker or speakers are projected on a screen and it is possible to have additional visual attention projected on another screen. This process also has been carried into the area of adult education with evening audiences. Margaret Mead has twice spoken with two-way questions and answers, and the Union Pacific Railroad has used this device for management development.

A very recent development took place in the spring of 1963 when the University of Colorado and the University of Omaha shared professors for two regular three-hour credit

the Air are enrolled with the correspondence schools of New South Wales, Queensland and South Australia. Students do their written work for the correspondence school and oral work for the School of the Air. Children from 5 to 15, and from what the Australians call "first class to first year secondary," are served by this program. Mr. Murphy has written that from Broken Hill, a mining town 650 miles west of Sidney, the School of the Air educates children scattered over half a million square miles in the states of New South Wales, South Australia and Queensland. Broken Hills School of the Air is conducted by the New South Wales State Department of Education, and makes use of the transmitting facilities of the Royal Flying Doctor Service of Australia. These facilities are comprised of a powerful transmitter located six miles out of Broken Hill and some 570 transceivers\(^\text{22}\) used by rancher-residents of this sparsely populated area. It must be stressed this is formal education, not enrichment or supplemental.

Reference has been made to the Royal Flying Doctor Service. About two million square miles--two-thirds of the Australian continent--are covered by this service, which operates from a chain of bases spread throughout the continent. Its purpose is to combine the speed of aircraft with the problems of overcoming great distance and handling

\(^{22}\)A transceiver is a radio transmitter receiver that uses the same tubes for transmission as for reception.
courses meeting three times per week at each institution. One course was Industrial Psychology, and the other was Social Psychology. At least twice each professor was to lecture on the other's campus. Identical examinations were to be given at the same time and the hope was that study of the results would reveal information about the success of this method. Further information on this process is available from the Bell Telephone Company or from the University of Omaha.

Thus the tele-lecture and the telephone instruction for the ill person represent closed circuit phone linkage which is two-way and where sound alone is the single medium involved. Moving closer to the present project are some examples of limited broadcast access, that is, using the air waves, but with limited public access. Currently functioning in Australia is a shortwave classroom for children located on ranches in the interior of the continent. The Australian Information Bureau has provided a description by Australian journalist, Hugh Murphy.21

This "school of the air" was started at Alice Springs, Northern Territory, in 1951 and has since been established in three Australian states. Under this arrangement, a classroom studio is manned by a headmistress who takes roll and hears recitation on specific lessons. All pupils of the School of

21Hugh Murphy, School of the Air, An Australian Institution (New York; Australian News and Information Bureau, n.d.). (Typewritten)
receiver within the coverage area of a station broadcasting the programs. Consequently, questions may arise about professional privacy, public impact, and the like, but these are questions which can only be briefly touched upon later, and, in the main, rest outside the scope of this study.

Literature on the two-way medical seminars is almost entirely descriptive. Ebbert\(^{24}\) has reviewed the Albany plan thoroughly and given but passing mention to the other three systems. Woolsey\(^{25}\) has written the most extensively of this method from his vantage point at the helm of the Albany network.

Specific research conducted on two-way medical seminars using FM radio-telephone as the broadcast medium is limited to the Delaware Medical Seminars Experiment.\(^{26}\) The hypothesis of this study was that a group of practicing physicians could increase their knowledge by participating in


\(^{26}\) Fred MacD. Richardson et al, "The Delaware Medical Seminars Experiment," GP, XXV, No. 4 (Philadelphia, Pa.: Pennsylvania Hospital, April, 1962), pp. 165-73.
emergency medical care. The two-way shortwave radio enables the doctor to be quickly located; and while flying to the patient, to give advice helpful to caring for the patient until his arrival. However, this aspect cannot be termed a formal educational tool. Further information is available from the Australian News and Information Bureau. 23

From the limited broadcast access typified by the two-way shortwave classroom in Australia, review of the literature moves to the specific area of this study, namely, the two-way audio educational tool in use with the open broadcast of FM radio. The relatively unlimited access to FM radio is pointless to argue. As applied to continuing medical education, it is similarly fruitless to belabor the technical differences between the two-way radio characteristics of the Albany Medical network on the one hand, and the two-way radio-telephone characteristics of the other three such networks in Pennsylvania, North Carolina, and Ohio. As detailed in Chapter I, the use of the telephone lines from hospitals to a broadcasting station is mainly a decision based on technical advice, topographical limitations, and convenience.

The important point, however, is that the end product, in all four existing networks, is an FM radio program, all portions of which may be heard by anyone with an FM

was done, so the factor of permanence of learning is open to question. There are enough other factors involved in this method that further research needs to be done.

Additional investigation should attempt to gain more basic information on this method of conducting the medical programs. The information sought should shed light on the nature of the specific audience, appropriateness of the subject matter, criticism of program components (such as lectures, slides, outlines, question-and-answer procedure) as well as teacher-learner acceptance.

Such information is sought in the present study by use of the descriptive survey. This approach appears justified since several academic disciplines are involved. As stated by Campbell and Katona:

Survey research has no specific disciplinary anchor point. It is being used by specialists in all fields of behavioral science, being adapted in each case to the requirements of that field. Survey data are broadening the empirical base of a variety of fields. They are also providing the raw materials for an increasing volume of cross-disciplinary analysis, which it may be hoped, will serve in time to help bring about a closer integration of the presently separated behavioral sciences.28

Moreover, use of the descriptive survey here may provide this investigator and others a better base for

a series of two-way radio conferences discussing certain areas of medicine. To test this hypothesis, a study was set up for testing the same area of knowledge twice, both before and after a series of two-way radio conferences.

With the cooperation of the National Board of Medical Examiners, two separate tests were prepared. A group of Delaware physicians volunteered for the test procedures. A total of 101 physicians volunteered for the first examination and seventy of these completed both of the examinations. Forty-one of these seventy physicians were active practitioners in Delaware. The difference in mean score attained by the seventy Delaware physicians between the two examinations was 1.6 score points. This difference was significant at the 5 per cent level of confidence.  

Among the physicians were some who were foreign educated. It was noted the average scores for the foreign educated group were considerably lower than those of the United States educated group and they did not improve on the second examination. On the other hand, researchers noted a 2.3 unit improvement in average score registered by the physicians educated in the United States, and this figure represents a difference which is significant at the 1 per cent level of confidence. This 8 per cent improvement would seem to confirm the researcher’s feelings that a change of knowledge level was achieved. In this experiment no further testing

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27Ibid., p. 169
future study of this educational method. Hyman notes:

The descriptive survey is thus a training ground for the development of a skill in conceptualization of the phenomenon and in the treatment of the findings in relation to error factors, both essential to effective analysis of explanatory surveys.  

More will be said regarding the specific application of the descriptive survey techniques to this study in Chapter IV. Having traced literature pertinent to two-way educational communications, the study is directed to the specific method in use at the Ohio State University. A description of the 1962-1963 program is now necessary.

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CHAPTER III

DETAILED DESCRIPTION OF 1962-1963 OPERATION

It will be recalled the Ohio State University two-way medical seminar system was developed with main reference to the Albany Medical School plan described in Chapter I. Therefore, a restatement of goals and methodology would be repetitive. More deserving of mention are specific characteristics of the Ohio program and some measures which serve to distinguish it from Albany or other plans.

A description of the 1962-1963 operation of the Ohio Medical Education Network is best initiated by indicating the schedule of programs, their titles, and the participants. Basic also is a list of the twelve participating hospitals and the Ohio cities in which they are located. Broadcast from 12:00 to 1:00 p.m., E.S.T., over WOSU-FM and WHIO-FM, the schedule of programs was as follows:

October 17  Problems in Management of Coronary Artery Disease
          James V. Warren, M.D.
          James J. Leonard, M.D.

October 31  New Developments in Diabetes and Hypoglycemic States
          George Hamwi, M.D.
          Orville C. Green, M.D.
November 14  Ulcerogenic Tumors of Pancreas (Zollinger-Ellison Syndrome) and Management of Pancreatitis
   Robert M. Zollinger, M.D.
   Daniel W. Elliott, M.D.

November 28  Rational Approach to Antithrombotic Therapy
   Samuel Saslaw, M.D.
   Warren E. Wheeler, M.D.

December 11  Use, Abuse and Complications of Tranexamic Acid
   Ralph K. Patterson, M.D.
   Rudolf Kaedling, M.D.

January 7  The Unconscious Patient—Differential Diagnosis and Immediate Management
   William E. Hunt, M.D.
   Perry R. Ayres, M.D.

January 15  Rererebral Renal Hypertension
   Chester C. Winter, M.D.
   James F. Schleyer, M.D.

January 16  New Thoughts on Birth Defects
   William J. Robertson, M.D.
   Martin Peter Saul, M.D.

February 13  Arterial Diseases of Arms and Lower Extremities
   Samuel A. Marable, M.D.
   Richard Patton, M.D.

February 27  New Prostaglandins—Use, Abuse and Complications
   Nichols Vorys, M.D.
   Paige K. Benson, M.Sc., Ph.D.

March 13  Anxiety—A Contagious Disease
   Eugene W. Green, M.D.
   Peter Gwynne, M.D.

March 17  Heart Disease in Premarriage
   John C. Ullery, M.D.
   Charles W. Wooley, M.D.

April 10  Resuscitation in Acute Respiratory and Circulatory Failure
   William Hamelberg, M.D.
   Charles W. Wooley, M.D.
Here follows a list of participating hospitals in Ohio and the cities in which they are located:

Marion General, Marion; Newark City, Newark; Lancaster Fairfield, Lancaster; Springfield City, Springfield; Springfield Mercy, Springfield; Chillicothe General, Chillicothe; Urbana Mercy Memorial, Urbana; Picua Memorial, Picua; Wright Patterson Air Force Base, Wright Patterson; Dayton Good Samaritan, Dayton; Dayton St. Elizabeth, Dayton; and Miami Valley, Dayton.

Sizes of these hospitals ranged from the 695-bed Miami Valley, with a staff of 546, to Urbana Mercy, with 75 beds and a staff of 48. Experience in the Albany Medical College programs had established that a maximum of twelve hospitals should participate on any one day so as not to shortchange the time available for questioning.

Studio moderator at WOSU for eleven of the thirteen programs was Dr. John Prior, Director of the Center for Postgraduate Medical Education.¹ On the other two programs Dr. William O. Robertson, Assistant Dean in Charge of Curriculum, acted as studio moderator.

The curriculum schedule noted above was set up by the Center for Postgraduate Medical Education, and the Ohio State medical faculty members were reminded by letter at

¹As of January 1, 1963, Dr. Prior was named Associate Dean of the College of Medicine and Associate Director of University Hospital, as well as Director of the Center. Also about the same time, the name "Postgraduate" was replaced by "Continuing."
least a month in advance of the program date and of their preparation requirements. These teachers were reminded of the importance of their appropriate and prompt selection of slides which were to be shown at each hospital in junction with the lecture to be given. Black and white were acceptable, but color slides were preferred. New slides could be made of photographs, x-rays and charts. Also to be supplied by each participant was a recent photograph of himself which, in slide form, would be flashed on at each hospital to identify the speaker visually at the start of his lecture.2

Each faculty member was to supply an outline of his talk. It was stipulated this was not to be a written summary or abstract but a subject outline of material that would be covered. Duplicates of these outlines were distributed to hospitals along with the slides in advance of the program. Finally, each speaker was to prepare ten questions related to his talk in the event these were needed by the moderator at the studio. The reminder letter contained specifics as to title, date, time and place, and suggested guides to the length of talks as being ten to twelve minutes. Eight to twelve slides were recommended as usable visual supplements for a time period of each speaker (about ten minutes).

2 The teacher delivered his visual material to the Center for Continuing Medical Education which ordered the 35mm color slides to be made up in twelve duplicate sets by the Medical School's Photography Department.
A deadline date by which the speaker's talk should be completed and rehearsed for tape recording at WOSU was indicated and a recommendation of attention to preparation for this audio presentation completed the essential information. The statement read as follows: "Since much of this program is audio, your presentation should be thoroughly rehearsed, must have clear cues for each slide and be presented with dynamic enthusiasm that is contagious." 3

Medical educators to speak on each program were urged to tape record their talks well in advance. The reason for such a measure was to insure quality and provide a means of getting the program on the air in case the participants were late in arrival. This happened on more than one occasion. In such an event the moderator could introduce the topic and speakers, and the tape was then played. In the event of injury or illness, the faculty member's material would be intact according to the slides and outlines previously distributed to the hospitals.

Moreover, the recording was done in the same studio, on the same microphone, and recorded on the same tape recorder that would be used in the live broadcast. These measures helped preserve a technical quality and a liveness of total production.

Of equal importance, the taping sessions provided two further benefits accruing to the educational goals of

3See Appendix B, p. 161.
this method: (1) The lecture could be monitored in advance to ensure that all slide cues for changing slides were voiced and de-emphasized by specific phrases or sentences. (Each slide used in a hospital had a number superimposed on a corner of the visual projection so that all viewers could be certain they were observing the correct visual illustration.) This is critical where the involvement is in varied classroom conditions. (2) The taping session also provided an opportunity for the medical educator to observe himself at home with his surroundings previous to the actual broadcast. Thus he comes more at ease, and more energy, and could concentrate on understanding and the actual progress with minimal concern for handling of the method.

Physicians in each of the four areas were eligible for one hour of Category I credit for each of the thirteen

Two hours of credit may be obtained by attending five postgraduate educational activities sponsored by an institution of higher education, a professional organization, or an educational association. One hour of credit may be obtained for attendance at an annual meeting of the American Academy of General Practice, an annual meeting of the American Association of Family Physicians, or an annual meeting of the American Academy of General Practice and the Academy of Family Physicians. One hour of credit may be obtained for attendance at an annual scientific meeting of a national medical society. One hour of credit may be obtained for attendance at a national scientific meeting of a local or state medical society.

Activities eligible for Category I credit include attendance at the annual meeting of the Academy of Family Physicians, attendance at a national scientific meeting of a local or state medical society, attendance at a national scientific meeting of a state or local medical society.

The procedures to be followed for the necessary advance approval of these activities are available from the state dental societies of the Academy.
programs as accredited by the American Academy of General Practice. Only about 20 per cent of general practitioners in this country are members of this professional association. Characteristics of the association are that in order to maintain membership in it, one hundred and fifty hours of postgraduate medical education, authorized or sponsored by the association, must be completed by each member every three years. It is the only professional medical association with such a requirement; and the aim, of course, is the upgrading and updating of its members. Investigation seems to reveal that the main motivation for obtaining credit and holding membership herein is the recognition within and without the medical profession of the significance of this effort by the practicing physician to better his practice.

It should be noted that internes and residents within a hospital were eligible to register for this credit also, which, when recorded by the Ohio Academy of General Practice at Columbus, Ohio, on their records, would become effective following their being issued a license to practice. Registration was made possible by the distribution of 3x5 cards to each of the participating hospitals on which physicians were instructed to record general attendance and specifically to indicate those names which were to receive AAGP credit. Following each program the cards were returned to the Ohio State Center for Continuing Medical Education.

Monthly reminder cards were distributed by mail to the 1,150 doctors connected with the twelve hospitals,
listing dates, time and subjects for the programs occurring
each month. Expense to the College of Medicine for the
year 1962-1963 was defrayed in part by an educational grant-
in-aid from the Warren-Teed Products Company, Columbus, Ohio.

On September 21, 1962, an eight-page manual of broad-
cast instructions and procedures was mailed to hospital
moderators and administrators and personnel at WHIO-FM. This
manual was prepared by the Manager of Program and Production
at WOSU Radio and contained a directory of participating hos-
pitals, their moderators and phone numbers, as well as a
calendar of program broadcast dates. The bulk of the manual,
however, was devoted to a step-by-step procedure of what was
to occur on each program and the specific time at which cer-
tain actions should be taken by radio stations or hospitals.
Also included were pre-broadcast and post-broadcast check-
off lists for hospital moderators containing reminders re-
garding the distribution of outlines, preparation of slides,
registration procedure, and the like. In addition to the
typical program format, supplemental information on the hos-
pital radio equipment and its use was also included.6

Basic equipment necessary in eight of the twelve
hospitals is listed below together with its cost at the
time. The total expenditure was $307.90.7

5See Appendix B, p. 162. 6See Appendix B, pp. 167-77.
7By tax-free purchasing, in quantity, the Telecommunica-
tions Center at the Ohio State University was able to keep
the cost to each hospital to a minimum.
1. Bogen-Presto Model RP-2 Preamplifier with one Cannon XLR-3-11C Connector . . . . . . $67.68
2. Electro-Voice Model 664 Microphone with one Cannon XLR-3-11C Connector . . . . . . 35.18
3. Atlas Model DS-7 Microphone Stand . . . . . . 2.50
4. Electro-Voice Model LR4S Loudspeaker . . . 49.00
5. Scott Model 314 Tuner with Case . . . . . . 90.00
6. Harman-Kardon Model DA-12 Power Amplifier with Amphenol 86-PM Connector . . . . . . 38.37
7. Finco Model FM-5 Antenna . . . . . . . . 19.81
8. Trimm Model 107 Headset with Phone Plug . . 5.36

The remaining four hospitals required only part of this equipment, since they had previously been affiliated with the similar type program offered by the University of Pennsylvania. Two of them spent $154.36; and two, $105.36. The initial expense for equipment would in most cases be a one time thing.

In addition to these initial costs, each hospital was responsible for paying for the Class D broadcast line from its meeting room to Columbus, Ohio. Class D rates were ten cents per hour per airline mile. On the average, including some extra phone installation charges and miscellaneous items, the total phone cost to each hospital for all thirteen programs was approximately $200.00. The Ohio State University assumed the cost of the line feed of the program to WHIO-FM in Dayton where it was also broadcast.8

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8A specific breakdown of costs for each hospital is available from Mr. William Miller, Major Account Executive, Ohio Bell Telephone Company, Columbus, Ohio.
loudspeaker while asking a question. Thus each hospital could hear its own questions, as well as all others, on its own loudspeaker. The classroom presence was further enhanced.

As executive producer for the medical seminars, this investigator had opportunity to make some informal observations about the actual programs. The October 3, 1962, "rehearsal" session revealed the potential for a few minor problems in technical operation. These were mainly typified by feedback or a ringing sound. The Chief Engineer at WOSU Radio made corrective suggestions to all hospitals one week previous to the first broadcast. Likewise, following the first three programs, additional refining suggestions were made regarding positioning of loudspeakers, placement of microphone, voice projection, and the setting of voice levels.

From this point on, technical operation was in the main satisfactory as far as could be observed. Difficulties were of such an occasional nature as to obviate the necessity of their mention. It should be noted here that the FM broadcasting, characterized as it is by static-free quality and high fidelity, proved a most satisfactory means of communication.

Some minor production problems encountered were these: (1) several of the teaching physicians seemed

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9See Appendix B, pp. 163-64. 10See Appendix 3, pp. 165-66.
Although the present study is not mainly concerned with technical aspects of operation, two items deserve brief comment, since they bear directly on the educational goals of this method. The first relates to the system whereby the hospital moderator signaled the studio he wished to ask a question. It will be recalled in the Albany plan the hospital moderator pushed a button to activate a light over his hospital name in the radio studio. For the Ohio State network, this procedure was ruled out in the interest of simplicity and expense. Instead, the light panel at WOSU was designed and constructed so that the hospital moderator's voice alone, at sufficient intensity, would activate a voice-operated relay which, in turn, would turn on the signal light. This measure served to keep classroom mechanics from interfering with the learning process.

The second item concerns the question-asking element itself. Several Dayton hospitals had the previous year participated in the Pennsylvania programs by telephone line and complained that when they asked their questions, it was necessary to cut the loudspeaker in their own auditorium or classroom. In a small room this would make little or no difference. However, in the larger room or auditorium the problem is quite apparent: attending physicians could not hear their own questions being asked. WOSU rectified this problem by selecting highly directional microphones and loudspeakers and giving careful instruction on their placement and use. It was thus not necessary to cut the classroom

Publicity was limited during this initial year for a number of reasons, not the least of which was money. However, this was not necessarily the only actual reason. A prime concern of both the Center for Continuing Medical Education and WOSU Radio was that the first year's venture into this method be made on a manageable basis, with emphasis on quality and a critical eye toward future improvement and expansion. The first year was to be a prototype which would provide some answers and raise some questions. Therefore it was essential to have a plan for assessing the two-way educational tool as it functioned under the Ohio State plan in 1962-1963.

11XXII, No. 4, XXIII, No. 1. 12LIV, No. 6.
surprised that this was not to be closed circuit but rather open broadcast; and (2) several of the initial lectures in the early part of the season, despite the written instructions to the contrary, were of excessive length. Basic orientation to the program requirements was re-emphasized by phone reminder to subsequent lecturers and the situation cleared up for the remaining programs. The surprise about open broadcast as against closed circuit, seemed to be the result of lack of information and understanding of this method, rather than antagonism to the idea. One distinctive noise factor in the WOSU studio—that of noisy steam radiators and pipes—was corrected by installation of a sump pump in the condensed water return system.

Reaction of medical educators to the programs generally was one of pleasant surprise. Most of the twenty-five seemed somewhat skeptical previous to the broadcast. In many cases, there was delight and enthusiasm following the broadcast of their program. A number remarked on the advantages of the directness of the two-way participation which nevertheless preserved a protective anonymity—in a sense, aesthetic distance. Most seemed impressed with the breadth and penetration of the questions asked of them. Nearly all gave some indication that the personal convenience and efficiency of this method overcame many of the teacher's time and distance problems implicit in continuing medical education.
CHAPTER IV

PLAN OF RESEARCH

From the outset the plan for researching the medical seminar programs was recognized as involving several disciplines. Therefore, extensive consultation was carried on with advisers in the Ohio State University Department of Speech, from the College of Medicine, and in educational broadcasting. The purpose of this evaluation of the first year of operation is to gain some indications for possible changes for the year 1963-1964, to evaluate the success or failure of the initial year, and to do so from as broad a frame of reference as possible. Furthermore, some of the results may well point the way to needs for further research. It is deemed essential to evaluate the teaching-learning aspects of this project in the context of a medium of mass communication and to ascertain how well this method meets some of the needs of continuing medical education.

The general objectives for this phase of the study are as follows:

1. To provide preliminary information on the general acceptance by participants of the two-way radio tool as a method for continuing medical education.
2. To help isolate some strong and weak features of the method.

3. To assess how well the method appears to meet a need for continuing medical education.

4. To suggest directions for change, modification, and improvement of the method.

5. To provide a clearer picture of interacting phenomena within teaching, learning, and communication in the field of continuing medical education.

In terms of a gross division, there are only three methods of obtaining data in social research: one can ask people questions; one can observe the behaviour of persons, groups or organizations, and their products or outcomes; or one can utilize existing records or data already gathered for purposes other than one's own research. 1

Certain problems make the use of surveys necessary. These include whether or not adequate information upon which to base conclusions can be obtained in any other way. For this study, most other information sources, including surveys, are not known to exist. Factors such as time, distance, availability, and willingness to cooperate on the part of the groups from whom information is sought all play key roles in justifying the use of surveys.

It is essential to seek information on the radio seminars as close to their broadcast as possible to help reduce memory error. The groups to be questioned, though

stratified generally in the medical profession, are separated geographically. The groups are separated in terms of function within the profession itself. Some are educators, some practitioners, and some function in both of these and other areas. One such area is administrative responsibilities.

The need for findings made quickly applicable in planning future programs is a paramount consideration. Although interviews with learning physicians were considered, they were ruled out for reasons of time, cost, and travel. The fact the study is being conducted by a single investigator also had direct bearing on the length of time needed to collect and evaluate interview information. Support for the study was limited to stenographic assistance, supplies and mail and phone privileges from the Telecommunications Center and from the College of Medicine at the Ohio State University.

Specific data desired should be meaningful to both the medical educator and educational broadcaster. The attempt to fulfill the general objectives of this phase of the study calls for some personal, environmental, and behavioral data. Such data might include records of opinions, attitudes, motives, and expectations. These latter types of content areas might prove the most rewarding.
Campbell and Katona observe: "This broad area of psychological data includes many of the most interesting questions available to survey analysis. It is also the area in which there are least likely to be data available from non-survey sources."²

However, such broad areas of study could be only partially included in the present research. Nevertheless, it was expected that the integrated inquiry could provide data useful in program planning.

Data are required on the two-way method on both the teaching and learning side. And although the educational broadcaster must be concerned with both, data on the electronic processes were minimized and simplified. The technical aspect of broadcasting was made subservient to the needs of teaching and learning. The broadcaster can modify the electronic devices most effectively when he has a clear picture of how well these devices are helping the teacher and the learner meet their own needs. Therefore the basic hypothesis posited for the present phase of this study is that an integrated sample survey of teaching and learning participants in thirteen two-way medical seminars would produce descriptive data of sufficient significance to be helpful in future program planning.

The sample to be polled is made up of three groups. The first group consists of those physicians who implemented the use of the radio seminars at their local hospitals. Many in this group were directors of medical education or hospital administrators. Most acted as broadcasting moderators at their hospitals during each program. Since twelve hospitals were involved, this group is the smallest, numbering seventeen. Although probably too small a group to be of statistical significance, this group’s reactions would have the value of representing both a teacher and a learner.

The second group is a major source of data in that all 1,150 physicians registered at the twelve hospitals served by the network were polled. Attendance cards had shown that only about 36 per cent, or 416 of the 1,150, had attended one or more of the radio classes at the twelve hospitals. However, the entire group was polled to avoid missing any attendance and to help cultivate a climate of critical inquiry which, it was hoped, might interest some non-attendees in future similar programs. This survey is designed, however, to eliminate all who had not attended any of the programs at a hospital since it is most important to obtain opinions from those who were completely familiar with how a complete program worked, including the written and visual material and the asking of questions.

Some of the larger hospitals had more than one person acting in this capacity. Thus the size of the group here exceeds the number of hospitals.
A third group is made up of the twenty-five medical educators in the Ohio State University College of Medicine, each of whom had presented lecture material and answered questions on one of the broadcast seminars.

Written questionnaires were deemed the most feasible method for conducting the research. The method of contact was by mail. A separate questionnaire was designed for each of the three groups. In each case, the attempt was to translate the specific objectives of this study into language understandable by respondents. To encourage response, the questionnaires were to be unsigned. The three separate questionnaires designed for the three groups will hereafter be referred to as Forms: A (Hospital Moderators); B (Learning Physicians); and C (Medical Faculty).  

Three basic types of questions were asked of these groups: those which asked for specific information; those which asked for an opinion or judgment; and those which invited general comment. Careful attention was given to the degree of probing in each question so that a maximal objectivity would be possible. Those questions which asked for an opinion were on a four-point scale with minor exceptions, where the three-point scale was felt to be necessary. It was hoped this measure would help eliminate tendency to choose the middle answer as in the case of a five-point scale. Some questions appeared on all three forms.

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4 See Appendix C, pp. 180-82; 184-86; 188.
The structure of Form B is as follows. There was a total of twenty-three questions. The final four questions were the same open-end questions which were used on Form A. Again, the purpose was to assist recall, lead thinking, and encourage suggestions and comments. Questions 1 through 6 were designed to obtain basic information as to type of physician responding, hospital affiliation, whether any of the radio programs were heard or not, whether any of the radio classes were attended at the hospital, how the physician heard about the programs and whether or not any of the classes were attended for AAGP credit. Questions 7 through 17 were questions on a four-point scale, while Questions 18 and 19 were on a three-point scale. Questions 7 and 8 checked on radio reception and classroom situation. Questions 9 through 14 sought evaluation of the elements of the programs (lectures, slides, outlines, questions). Questions 15 and 16 sought to establish any change in use of journals, reference works and the like, as a result of the programs; and Questions 17 through 19 sought an opinion as to effectiveness of this method of instruction, meeting of a need, and intention to attend similar courses in the future.

The structure of Form C is as follows. Eight open-end questions comprised this questionnaire. Since each of these men had working acquaintance with only one program, it was felt the most valuable information could be obtained by giving as much freedom of expression as possible. Question 1 invited the medical educator to comment from a teacher's
Questions on similar areas of investigation were changed only in wording to be more meaningful to the group polled. To aid in the establishment of rapport and encourage response, cover letters accompanied all mailed questionnaire forms.

Pre-testing of drafts of the questionnaires was ruled out in the interest of making the inquiries close to the date of the conclusion of the broadcast programs. However, all three questionnaires were submitted to advisers in the College of Medicine, the Telecommunications Center, and the Department of Speech. In consultation, the questionnaires were revised and given final approval. A brief outline of each questionnaire follows.

Form A was constructed as follows: Questions 1 through 14 were a check list of answers to be filled in by a cross (X); Questions 15 through 18 were open end and were intended to give the person answering the widest latitude for comment. Questions 1, 2, and 3 helped establish location, radio reception, and how often written instructions were used; Questions 4, 5, and 6 gave opportunity for opinion on the effectiveness, serving of a need and intention to use again; Questions 7 through 14 rated elements of the program, such as lectures, slides, outlines and questions, as well as the conduciveness of each hospital's classroom to this mode of instruction. Eleven of the fourteen questions were on a four-point scale. Two were on a three-point scale, and Question 1 asked only for direct information (one station or another).
nine forms were completed and returned to the investigator. Subsequent to this meeting Form A was mailed to the eight remaining moderator/administrators who were absent. The mailed Form A was accompanied by a cover letter under the name of this investigator.  

Two weeks later (April 26, 1963) Form B questionnaire was mailed to the 1,150 physicians registered at the twelve hospitals served by the Ohio Medical Education Network. Form B was accompanied by a cover letter from the Director of the Center for Continuing Medical Education. Also enclosed was an addressed and franked return envelope. These measures were taken to encourage response.

Three days later (April 29, 1963) Form C questionnaire was sent with a cover letter from the Director, and a return envelope, to the twenty-five medical educators from the Ohio State University College of Medicine, each of whom had been involved with one of the broadcast seminars.

Cut-off date for all three questionnaires was set at May 30, 1963. No follow-ups were necessary for the Form A since the return was 100 per cent. No follow-up was made for Form B since the plan was to evaluate only those questionnaires from physicians who had attended one or more programs. By the cut-off date 275 responses had been received with 200

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5See Appendix C, p. 179.
6See Appendix C, p. 183
7See Appendix C, p. 187.
viewpoint on the two-way radio seminar as a method of instruction. Question 2 sought mention of difficulties of preparation encountered with program elements (lecture, outline, use of slides). Question 3 was concerned with whether sufficient radio orientation was given to each teacher. Questions 4 and 5 sought judgments on the kinds of questions asked on the programs and indications of any audience follow-up as the result of the program. The last three questions (6 through 8) again invited general comment. A question on suggested topics was not included here since these men were specialists in their individual fields and not concerned with the overall curriculum.

Implementation of the questionnaires was as follows. A meeting was scheduled for April 11, 1963, which was the day following the broadcast of the final program in this year's curriculum. Held at the College of Medicine, the meeting was attended by the moderators and/or administrators from the twelve hospitals who participated during the past year. Also present were Ohio State University medical and broadcasting personnel, including this investigator. Although all seventeen moderator/administrators were invited to participate, only nine were able to attend.

As an initial source of information, a tape recording was made of the entire discussion which reviewed the past year's programs, evaluated them, and made recommendations regarding future programs. Following the discussion, Form A questionnaire was distributed to the nine attending. The
which reporting physicians were classed according to specific area of the medical profession. Results showed 930 attendances by physicians in general practice, with 1,067 attendances by physicians in twenty-three specialties, subspecialties, or classed as internes. The quickly apparent total of 1,997 attendances does not agree with the previous total of 2,462, since some hospitals neglected to send registration cards which noted practices, or did not give total attendance figures for each program. Thus, no figure is absolutely correct so far as total attendances are concerned.

As mentioned earlier in this chapter, it was possible to ascertain, by names on the registration cards, that approximately 416 individual physicians attended one or more of the thirteen two-way programs. Although these figures are inexact, they are a useful comparative reference in analyzing the data provided by the questionnaires sent to the learning physicians.
indicating attendance at one or more programs in the local hospital. When it is recalled that 416 individual physicians had been identified by name on attendance cards, the 200 respondents may be seen to represent nearly 50 per cent of the group best qualified to judge the programs and most likely to have a reason to respond. Two follow-ups by telephone were made for Form C, with the final response being nineteen of the twenty-five polled.

Since the time element was of critical importance, all returns of the three groups of questionnaires were routed through the Ohio State Center for Continuing Medical Education. Thus suggestions for future topics and any great defects in the programs, made obvious by a very high frequency of mention, could be dealt with temporarily until the systematic appraisal of this study could be completed.

Moreover, the registration and attendance cards returned to the center by the hospitals following each program were tabulated and the figures kept on hand for reference purposes. Total number of attendances recorded for the thirteen programs in 1962-1963 was 2,462, with the highest single attendance 239, the lowest, 170, and a mean average attendance of 189.4. Within the total attendances, 824 requests for AAGP credit were registered. The highest number of credit requests on an individual program was seventy-five, and the lowest, fifty-two. Mean average of credit attendances was 63.4 for the thirteen programs.

A tabulation of attendance cards was also done in
CHAPTER V

ANALYSIS OF DATA: THE TEACHER

Three sets of mail questionnaires were sent to three groups involved with the 1962-1963 Ohio Medical Education Network. Form A went to the seventeen hospital moderators; Form B, to all physicians registered in the twelve hospitals; and Form C, to the twenty-five faculty members from the Ohio State University College of Medicine, each of whom acted as teacher in at least one radio-telephone seminar.

TABLE 1

FREQUENCY OF RETURN AND TABULATION OF THREE SETS OF QUESTIONNAIRES SENT TO PARTICIPANTS

<table>
<thead>
<tr>
<th>Form</th>
<th>Number Sent</th>
<th>Number Returned</th>
<th>Number Tabulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>B</td>
<td>1,150</td>
<td>275</td>
<td>273</td>
</tr>
<tr>
<td>C</td>
<td>25</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Forms A and B were largely objective short-answer questions, giving a number, making a forced choice selection of specific alternatives, or rating on a three or four-point scale some aspect of the programs. Both A and B concluded with four open-end questions which were designed to encourage general comment. Form C was made up of eight direct,
open-end questions, designed to elicit comment from the teacher's viewpoint. Results will be reported for each form with summary and conclusions following.

Forms A and C provide data based on the teaching aspect of this method, whereas Form B provides data oriented to the learner. Therefore, Forms A and C will be reported in this chapter as well as the preliminary information derived from the tape recording of the conference of moderators. Chapter VI will report and analyze the returns from the 1,150 learning physicians polled.

The discussion on April 11, 1963, between hospital moderators, administrators, Ohio State University Medical School personnel and WOSU Radio brought out a number of salient questions regarding the past year's two-way radio seminars. Reaction seemed to be somewhat critical of the outlines distributed before the programs. It was recommended these be more detailed and thorough and that they be distributed much further ahead of time than during the past year. The moderator at each hospital promised to see that they were made available to all personnel. It was further recommended that the outlines be made more a summary than an outline and contain schemes of treatment, new developments, and a reference bibliography. It was suggested that as much space for notes be left as possible within the limits of a two-page outline per speaker.

One reason for bibliographic detail came from the representative of a small hospital. The statement was: "We directly oriented to the problems encountered in general practice rather than specialization. Furthermore, the discussants believed better publicity of these seminars was called for in staff meetings and through other channels of promotion.

A considerable amount of time was spent in discussing individual topics and their treatment, and again the practical aspect stood out in the recommendations. At the top of the list was pharmacology. This was thought to need to be more practical, i.e., to discuss treatments, effects, and experience. Presentation of a case was thought to be a topic which would lend itself to greater depth. In such an event, details of management could be included in the outlines to help save time.

Other topics mentioned were rheumatic fever, chemotherapy in cancer, radioactive isotopes, experiences of doctors at the Ohio State University in clinic and research projects (Comment on this topic was: "I tend to believe what I hear from Columbus where I went to school."). cardiopulmonary disease in older people, psychosomatic medicine, preventive medicine at the office practice level.

Three other topics were mentioned which did not have as unanimous endorsement. They are as follows: nursing (operating room techniques), paramedical functions of nurses, and intensive care unit (both medical and nursing staff unit). The discussants felt these should be investigated more thoroughly, and several recommended checking with the nursing
don't have a record librarian to order and post special references." Representatives from the College of Medicine offered to make reprints of a speaker's total writings and references available, and the Director recommended the copying service, which is available from the Ohio State University Library to any physician in the state.

The discussion turned to the curriculum itself, and the question was raised as to whether thirty to thirty-five minutes was sufficient for dialogue on some topics. Here again, the reaction seemed to be a need for more depth to some of the topics. Further consideration seemed to indicate that the amount of time allowed for discussion would be adequate if the written and visual material were given more thorough treatment.

In the conduct of the programs themselves, the consensus seemed to be that the speakers were good. Some felt they wished they would have the opportunity to come back on a question with some further remark or refutation. The possibility of an occasional open program was made to make more spontaneous discussion possible. One moderator suggested the measure that "If you don't like an answer, go up to the microphone for discussion." (Moderator refers here to an attending physician in a hospital class.) However, although several agreed with him, several others maintained this would result in chaos and be an interference with significant progress within a program. More unanimity was expressed on the thesis that the programs should be more
centers at their hospitals. Several also expressed some doubts for fear there might be some conflict of interest between the professions of nursing and general medical practice. One final topic possibility was mentioned as that of a grand rounds (actual patient and case history are presented to assembled medical personnel), with slides of x-rays, graphs, etc., distributed in advance.

A question was raised as to the frequency of these seminars. Opinion was about evenly divided on the advantages of the bi-weekly as against the weekly broadcast. However, most seemed to agree that it was easier to remember a regular weekly appointment rather than the alternating setup. Furthermore, several made the observation that most of their attendees were regular and would be regular if the programs were offered each week.

An Ohio State University Medical College member inquired whether there was any follow-up discussion in the hospitals after the programs. The general reaction from moderators was that this was difficult because of schedule commitments; and while many physicians were able to free Wednesday morning, most were occupied at one o'clock.

Brief discussion went on about the possibilities for some examination to determine effectiveness of these programs. It was felt this would need careful consideration, and one physician from a Dayton Hospital which had participated previously in the Pennsylvania programs indicated the attempt to examine was unsuccessful several years ago.
Although the foregoing discussion and recommendations were informal, it was felt they served as indications of areas in need of further consideration. Many of the areas touched upon are given more systematic treatment by the questionnaires. However, four areas were emphasized, two of which stressed need for improvement, the other two indicating satisfaction with program length and speakers: (1) program topics need to be more basic and practical in subject and presentation; (2) outlines, distributed in advance, need to be more basic, more summarized, and bibliographed; (3) speakers were generally good; and (4) one hour program length is adequate.

With the 100 per cent response of seventeen moderators to Form A, Question Number 1 revealed that ten had listened to the programs as carried by WOSU-FM, while seven heard them on WHIO-FM. Since it was known that WOSU-FM was able to serve seven hospitals and WHIO-FM, five, these figures validated the distribution of the questionnaires, which did not require a signature.¹

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISTRIBUTION OF HOSPITAL MODERATORS ACCORDING TO RADIO STATION OVER WHICH PROGRAMS WERE HEARD</td>
</tr>
<tr>
<td>WOSU-FM, Columbus, Ohio .......... 10</td>
</tr>
<tr>
<td>WHIO-FM, Dayton, Ohio .......... 7</td>
</tr>
</tbody>
</table>

¹See Appendix C, pp. 180-82, for example of Form A questionnaire.
In rating the two-way seminars as a teaching aid, better than two-thirds of the moderators felt the seminars were excellent by comparison with other teaching aids used in their hospitals, and fourteen of the seventeen felt these programs offered learning experiences not otherwise available to their fellow physicians. All seventeen indicated they would use the programs the next year.

TABLE 6
RATINGS OF EFFECTIVENESS ON TWO-WAY PROGRAMS FOR POSTGRADUATE MEDICAL EDUCATION WHEN COMPARED WITH OTHER TEACHING AIDS IN LOCAL HOSPITAL--FORM A

<table>
<thead>
<tr>
<th>Rating</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>2</td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>Excellent</td>
<td>12</td>
</tr>
</tbody>
</table>

TABLE 7
FREQUENCY OF REPORT ON WHETHER OR NOT MEDICAL SEMINARS PROVIDE LEARNING EXPERIENCES NOT OTHERWISE AVAILABLE IN LOCAL HOSPITAL--FORM A

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>14</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
</tr>
</tbody>
</table>

TABLE 8
FREQUENCY OF REPORT ON INTENTION TO USE TWO-WAY MEDICAL PROGRAMS IN LOCAL HOSPITAL IF OFFERED NEXT YEAR

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
</tr>
</tbody>
</table>
On Form A, fifteen of seventeen respondents indicate there was always satisfactory radio reception of the programs in their hospitals. Moreover, over 50 per cent never or seldom made use of their manuals of "Instructions and Procedures" for utilizing the programs. All but three indicated their classes were never or seldom interrupted by outside factors such as calls, noise, or people. These findings suggest that the technical and physical use of the programs was adequately simple and a success.

TABLE 3

FREQUENCY OF REPORT ON SATISFACTION WITH PROGRAM RECEPTION IN LOCAL HOSPITAL--FORM A

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>15</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Seldom</td>
<td>1</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
</tr>
</tbody>
</table>

TABLE 4

FREQUENCY OF REPORT ON USE OF PROCEDURE MANUALS BY MODERATORS IN LOCAL HOSPITALS

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>3</td>
</tr>
<tr>
<td>Seldom</td>
<td>6</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
</tr>
</tbody>
</table>

TABLE 5

FREQUENCY OF REPORT OF INTERRUPTIONS BY CALLS, NOISE, PEOPLE, ETC., DURING PROGRAMS AT LOCAL HOSPITAL--FORM A

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>3</td>
</tr>
<tr>
<td>Seldom</td>
<td>11</td>
</tr>
<tr>
<td>Frequently</td>
<td>3</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
</tr>
</tbody>
</table>
TABLE 11

FREQUENCY OF REPORT ON SATISFACTION WITH GOOD COMMUNICATION OF LECTURE MATERIAL BY TEACHING PHYSICIANS--FORM A

None of the time .................................. 0
Part of the time .................................... 1
Most of the time .................................... 11
All of the time ..................................... 5

By inference the above findings further suggest satisfaction with the amount of time devoted to questions and answers in each program, a conclusion partially confirmed by the findings reported in Tables 14 and 15 on page 85.

Another question rated the extent to which the slides were considered a help to the programs. Over 88 per cent of the seventeen moderators felt the slides valuable most of the time or very much, with 76 per cent being in the top rating of very much. Later findings in Form B raise some question about this conclusion.

TABLE 12

FREQUENCY OF REPORT ON DEGREE TO WHICH USE OF SLIDES HELPFUL TO PROGRAMS IN LOCAL HOSPITAL--FORM A

Very little ........................................ 1
To some extent ..................................... 1
For the most part ................................... 2
Very much .......................................... 13

Regarding the outlines of the lectures, duplicated and distributed in advance to the hospitals, over one-third of the seventeen moderators felt the outlines were seldom
Specific elements of the broadcast seminars were rated by the seventeen moderators on Form A. One element investigated was the lecture portions of the thirteen programs. Here, sixteen of the seventeen moderators felt the lecturers communicated their lecture material well either most or all of the time. Moreover, all seventeen felt the lectures were well-prepared either frequently or always, with nearly two-thirds indicating always. These indications seem confirmed by another question which reveals that the lecture portions of the programs (about twenty minutes, two speakers) were never or seldom too long in the opinion of sixteen of the seventeen moderators.

### TABLE 9

**FREQUENCY OF REPORT ON EXCESSIVE LENGTH OF LECTURE PORTIONS OF MEDICAL PROGRAMS—FORM A**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>11</td>
</tr>
<tr>
<td>Seldom</td>
<td>5</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
</tr>
</tbody>
</table>

### TABLE 10

**FREQUENCY OF REPORT OF SATISFACTION WITH APPARENT LECTURE PREPARATION—FORM A**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
</tr>
<tr>
<td>Always</td>
<td>11</td>
</tr>
</tbody>
</table>
TABLE 14

FREQUENCY OF REPORT ON EAGERNESS WITH WHICH QUESTIONS SUBMITTED BY ATTENDING PHYSICIANS AT LOCAL HOSPITAL

<table>
<thead>
<tr>
<th>Frequency of Report</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the time</td>
<td>0</td>
</tr>
<tr>
<td>Part of the time</td>
<td>4</td>
</tr>
<tr>
<td>Most of the time</td>
<td>12</td>
</tr>
<tr>
<td>All of the time</td>
<td>1</td>
</tr>
</tbody>
</table>

TABLE 15

FREQUENCY OF REPORT OF WELL-ANSWERED QUESTIONS ASKED FROM LOCAL HOSPITAL--FORM A

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>3</td>
</tr>
<tr>
<td>Often</td>
<td>14</td>
</tr>
</tbody>
</table>

Concluding Form A were four open-end questions which requested general comment, criticism and suggestions of topics for future programs. A content analysis established several categories in which frequency of types of similar response were catalogued. From such information some trends were observed which could perhaps be related to findings in Forms B and C.

In a category of topics recommended for future courses, those receiving the most frequent mention were emotional and psychiatric illnesses and psychosomatic medicine; presentation of clinico-pathological conferences; and basic science aspects emphasizing pharmacology. There was some suggestion of need for refinement in the 1962-1963 curriculum and need for checking with other hospital staffs for future topics.
detailed enough to be of reference value following the pro-
grams. This finding is given additional significance by a
similar question on Form B.

TABLE 13

FREQUENCY OF REPORT ON LECTURE OUTLINES BEING
DETAILED ENOUGH FOR REFERENCE VALUE
FOLLOWING PROGRAMS--FORM A

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>6</td>
</tr>
<tr>
<td>Frequently</td>
<td>10</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
</tr>
</tbody>
</table>

Moreover, when Table 13 findings are considered
against the recommendations for more detailed outlines made
at the conference of moderators reported earlier, it seems
logical to conclude a large percentage of the ten respond-
ents who marked "frequently" probably leaned more toward the
judgment "seldom" than toward "always."

Two questions on Form A examined the question-and-
answer portion of the radio seminars. In one of these,
thirteen of the seventeen moderators felt that questions
were submitted eagerly by attending physicians most or all
of the time. Moreover, the other item showed fourteen of
the seventeen moderators feeling the questions asked on the
programs were often well answered, with often as the most
affirmative choice on the four-point scale.
Following is a complete listing of topic suggestions, with items receiving the largest number of responses appearing first. (Where there is no indication of number of responses, the item has been mentioned only once.)

1. Emotional: psychiatric illnesses, psychosomatic medicine--5.

2. Presentation of Clinico-Pathological Conferences (CPC)--3.

3. Cardiovascular diseases and treatment: congenital heart lesions, SBE (Sub-acute Bacterial Endocarditis), pericarditis--2.

4. More emphasis on basic science aspects: chemistry, physiology, pharmacology--2.

5. Preventive medicine.

6. Radioactive isotope usage in all fields.

7. Pharmacology: actions and side effects, contraindications of drugs; base evaluation on experience at the Ohio State University in medical school and hospital.

8. Administrative problems of local hospitals, such as
   a) Scope and responsibility of Tissue Committee.
   b) Scope and benefits of Utilization Committee.
   c) Problems and answers presented to Hospital-Infection Committee.
   d) How to conduct medical audit of medical service.
   e) Setting up criteria for judging competency of medical therapy.
f) Medical-legal responsibilities of procedures and staff relationships in private or small hospital.

9. The physician's approach to a "personal profile" on his continuing education.

10. The great potential for "good medicine."

11. One or two grand rounds. \[Actual patient and case history are presented to assembled medical personnel.\]

Because of the small number polled (seventeen), the remainder of the responses were quite varied. Only limited generalization is possible except for the category, "General Reaction to First Year." Here there were eleven favorable respondents and no unfavorable ones. Specific favorable responses and frequency of their mention are listed in Table 16.

<table>
<thead>
<tr>
<th>TABLE 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY OF FAVORABLE RESPONSES UNDER CATEGORY &quot;GENERAL REACTION TO FIRST YEAR&quot;</td>
</tr>
<tr>
<td>Course was well presented and prepared ............... 9</td>
</tr>
<tr>
<td>Hospital is interested in further participation . 7</td>
</tr>
<tr>
<td>Course was of value to staff ...........................3</td>
</tr>
<tr>
<td>Hospital is grateful for this opportunity .......... 2</td>
</tr>
</tbody>
</table>

Some critical suggestions were made in other categories regarding lecture outlines, scheduling of radio seminars, and techniques used on the programs. Although these were too occasional to establish trends, they may be of significant value. Moreover, these areas were also checked in the Form 3 questionnaire. A brief summarization is
pertinent, however. In comments under the category of program preparation, four responses were noted which related to the topic outlines. Three of these stressed that the outlines should be more complete and detailed, and the fourth suggested the radio presentation actually follow the outline more closely. General comments under program preparation suggested in two responses the need for including less theory and more practical material on the basis of the teacher's own experience. Another response urged more publicity be given the seminars, and a final one inquired as to the possibility of presenting the seminars on television. The comments on outlines again confirm judgments expressed at the moderator's conference reported previously.

In the category of technical problems, only three responses occurred: (1) poor reception; (2) better tuning is desirable; and (3) better instructions on feedback are needed. The first two are somewhat nebulous and depend on so many factors as to defy conclusive analysis. A partial answer may lie in response 3. The function of instructing the hospitals and individual personnel on the use of this method is a continuing problem which calls for greater effort by educator and broadcaster.

Under a category entitled "Scheduling of Radio Seminars" two responses obtained suggested the seminars be presented weekly. Two others remarked they could not attend as often as they desired. The fifth and sixth responses saw the problem from a different angle. One recommended each
subject be presented in two parts, i.e., two one-hour programs. The other response suggested an alternative measure of presenting each program two or three times, with only one-half to one-third of the hospitals (six to four) participating on each program. This was viewed as a means for allowing more time for questions and answers and would, in the respondent's own words, "...give the doctor an opportunity to participate when conflicts in schedule come up."

These suggestions raise many problems inherent in the broadcast networking of such a service. Nevertheless, multiplication of the service is feasible. A more pressing question arises in the area of teaching resources per se. How often can the same medical teacher be available for the live question-and-answer periods? This is an area which needs further study. However, it must be recalled the earlier results of the Form A questionnaire indicate general satisfaction with the question and answer period. These responses may also find their root in the highly relative value of what is often termed "convenience." Later findings will perhaps make possible stronger conclusions.

A final set of four responses more specifically deals with the participation by the physicians hearing the programs. Two responses recommended more active participation, i.e., more discussion when there would be difference of opinion.

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2See Tables 8, 9, 10, pp. 81-82; and Tables 14 and 15, p. 85.
with the answer given to a question, and more opportunity for critical analysis of certain situations presented by the teachers. The feasibility of these recommendations rests largely in the nature of the topics chosen and the ratio of formal to informal education desired by teacher and learner. Thus the weight given such possibilities belongs to the medical educator.

A third response suggested the medical instructors not resort to what was termed "dogmatic answers" to specific questions. This is at best a relative value judgment and, being noted, deserves no further comment. Finally, a response cautioned against duplication in questions. The response did not make clear whether this was directed to moderators in the hospitals so they would screen questions more carefully or to medical teachers. The point seems somewhat unnecessary since the two-way method insures that all participants hear all questions and answers. Therefore, class and studio moderators and teachers should be able to keep repetition of questions and answers to a minimum.

In summary, then, the data obtained from Form A provide bases for concluding that this method is judged as meeting a need, acceptable, simple to use, and worth continuing. Critical suggestions appear mainly toward refinement of either specific elements of the programs, their subject matter, or their purposes. Having analyzed the views of the "classroom teachers" or moderators in this
method, the area of analysis now becomes the "studio teachers" or medical educators.

Form C, it will be recalled, was returned by nineteen of the twenty-five medical faculty members polled. With the exception of one physician who appeared on two programs, each instructor was known to have been concerned with but one program. It was felt, however, that a composite of reactions to the single programs might provide additional guidelines for evaluating the teaching aspect of two-way broadcast medical seminars as an educational method.

The initial question of eight open-end inquiries on Form C requested the pollees to judge the radio seminars specifically as a method of instruction for postgraduate medical education. Of the nineteen respondents, twelve responded favorably; six were uncertain or had no opinion; none responded unfavorably; and one gave no response. It is perhaps significant the favorable responses, in a preponderance of cases, included references to specific characteristics of this method which makes it desirable from a teaching viewpoint: e.g., "personal contact and rapport," "efficient," "all advantages of meetings without time and cost disadvantages," "intellectual challenge," and what can be reworded as "availability to many who could not otherwise benefit."

Following is a listing of favorable comments on the

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3 Sample questionnaire appears on p. 188 in Appendix.
worn off then this would influence me to continue this method of instruction.

2. I would need some feedback to answer this question.

3. No opinion, as I am not on the receiving end.

4. From what little information I have at hand, it would appear to me that this is a good method of instruction.

5. It may wear out in the future, but as long as people want to utilize it, I would be encouraged to go ahead with more programming.

6. Probably good, but will improve with development of skills by panelists and moderators.

The second question on Form C sought indications of what difficulties were encountered by each medical educator in preparing for his program, especially considering the elements of lecture, outline, and use of slides. Twelve of the nineteen respondents stated simply that there were "none." Another six offered a general response or suggestion, and one gave no response. The six general responses follow:

1. It would be nice to have a mock slide projector.

2. Lack of knowledge about the audience, how much can I expect them to know?

3. Trying to conjure up an approach that would provide what the listener was seeking. In effect, it is an attempt to mind read the listener. Secondly, to avoid being too specialized in using terms of an unfamiliar variety.

4. Probably should delineate topic a bit more specifically.
above-mentioned question exactly as they appeared on the returned questionnaires.

1. Excellent method.

2. Good from teacher's standpoint.

3. Very adequate and efficient means of instruction.

4. Well accepted.

5. A chance to put across a few points.

6. Excellent method—should improve as participants recognize video potential.

7. Good method of instruction with a surprising amount of personal contact and rapport.

8. Think it offers almost all advantages of meetings without time and cost disadvantage.

9. Encouraged more intellectual challenge than sales pitch in many meetings.

10. Useful and effective method to reach an audience of medical men who otherwise might not be able to participate in university program.

11. It has good possibilities.

12. Comments I have heard indicate the seminars were well accepted.

The six respondents whose answers listed below were classified as uncertain or no opinion are self-explanatory and appear predicated mainly on audience opinion and improvement of the mechanics of the two-way method.

1. If each hospital has good audience after novelty has
5. I should have given better and more distinct audible instructions to change the next slide. Instructions on this should be emphasized to speakers.

6. No difficulties different from live lecture.

It will have been observed above that two of the general responses dealt with a problem of perennial concern to the communicator, whether he be teacher or broadcaster: knowledge of his audience. That this is an important problem cannot be denied. However, a quick answer is not possible. The best that can be urged is a continuing atmosphere of critical inquiry and exchange of ideas between educators and communicators. The remaining four responses are, in the main, concerned with mechanics, and, based on the one-time experience of each respondent, offer limited grounds for generalization. The reference to a "mock slide projector" may mean this medical educator wished to have the slides also shown simultaneously in the broadcasting studio while the program was occurring. However, there exists no practical way to prove this speculation. A significant conclusion is possible from these findings, however. The two-way method does not seem to constitute a device so different from regular teaching as to pose difficult problems for the educator in preparation for a program.

Question 3 on Form C further confirmed the preceding conclusion. Asked to comment whether or not sufficient radio orientation had been given for their broadcasts, eleven of the nineteen medical teachers responded simply "yes." None
said "no"; and one did not answer. Of the remaining seven responses, six emphasized they also felt the radio orientation to be sufficient, and three chose to elaborate or qualify. Only one respondent indicated a feeling of awkwardness at the pre-recording of his lecture portion due to the lack of a live audience. His suggestion of having a few people present may have some value; however, it would seem that some additional practice before recording would perhaps help increase the ease and spontaneity of the recording situation. The seven responses of a general nature follow:

1. Orientation was adequate, sufficient, pleasureable, etc. (4 responses)

2. For those of us not used to broadcasting, it is a little awkward to speak without an audience and give it the same kind of feeling that one would do if an audience were present. Some attention might be given to the setup during pre-recording of the opening statements, such as having a few extra people present. When it comes to the questions and answers, there is a feeling of audience presence.

3. For me, plenty! (Certainly others might have liked more--I had attended two sessions); but I suspect those most in need might not have used it.

4. Yes, however, I think it is important that each speaker actually write out what he is going to say in advance.

In summary, then, the radio orientation to this two-way method seems confirmed as sufficient by seventeen of the
particular hospital. I was not convinced that there was any spontaneous or very original questions asked.

5. There were two kinds of questions, one kind for information; the other kind came from men who wanted to display their knowledge of the literature. I think this is to be expected.

It may be readily observed that the first two responses immediately above are, though qualified, mainly favorable. The third response is an observation without a verdict in any direction. It is possible to conclude that this respondent considers the questions at least equal to the calibre of those at the County Medical Society meeting; but, of course, it is not clear what his estimate is of the value of such questions. Response Number 4 above was definitely unfavorable and is self-explanatory. The fifth response, though somewhat stoic, leans toward an unfavorable judgment. It is apparent, however, that on this matter of the kinds of questions asked, Form C has revealed nearly two-thirds of the nineteen reporting educators deemed the questions to be of value. Only one made no response.

An attempt was made to ascertain the degree of inquiry following the program which might have come to each teacher as the result of his program by correspondence or other means. One of the nineteen respondents gave no response, and seven reported "none." Eleven indicated modest or minimal inquiry by letter, phone, or in person.
nineteen respondents. Teaching has thus been aided rather than burdened.

Form C's Question 4 sought views on the kinds of questions asked of each teacher on his program. Thirteen of nineteen respondents viewed the questions favorably, using terminology such as "appropriate," "high level," "reflect close attention," and "showed real need." Other significant remarks among the thirteen favorable opinions expressed included references to the clearness and generous number of questions, the fact the type of the questions stood as proof of audience interest, and the feeling these questions were equal in calibre to those from what was called a "live" audience. The reference "live" was, of course, to the face-to-face situation in the classroom or auditorium.

A second category into which opinions on the questions asked of teachers during programs were put reflected qualified or unfavorable response, as follows:

1. They were good questions, but probably the result of attempting to condense a large topic into a brief discussion.

2. It's been so long ago I have forgotten many of them, but they seemed to be pretty good.

3. No different than questions asked when giving talk at County Medical Society.

4. Most of these questions were probably especially prepared by the one designated to handle the program in a
responded with statements desiring more audience feedback and consultation, expanding the programs to more hospitals, complimenting the method, and suggesting more practice for the teachers and the encouragement of more controversy between speakers. Specific statements are listed below:

1. I would like to have a better understanding of the audience when the program is being prepared.

2. Would have to know more about audience reaction.

3. Perhaps the audience could be asked beforehand to specify what they would like to hear about especially. (I assume you are asking for their reactions now.)

4. Better answered from the other end (audience). I have no personal suggestions.

5. Expand the program to include more institutions.

6. Practice.

7. I would raise the question about the topics. Are the topics that were selected of interest to the hospitals participating?

8. Introduce more controversy between speakers.

9. Good job, well done. (2 responses)

It will have been noted above that responses 1 through 4, and also 7, are essentially concerned with knowledge of the audience, its makeup, and its preferences. It is therefore possible to conclude that there is need for more "interior" publicity about this method with better orientation
The specific responses are noted below:

1. Four to twelve questions after each program.
2. I have had a few letters—not more than three or four.
3. One letter, from a physician.
4. One letter with question.
5. Very little.
6. Practically none, except for two inquiries.
7. No correspondence—four or five personal questions and comments.
8. I don't know. Several phone calls may have been related.
9. Number of letters—several invitations to speak.
10. Minimal.
11. Number of favorable comments from individuals upon meeting them later. Several letters re: specific problems related to broadcast outline.

The above findings indicate what seems to be a rather small stimulation beyond the program. However, it must be considered that this could also be the case if the program and materials are doing their job well. Only further research could provide more certain conclusions.

Questions 6, 7, and 8 on Form C gave opportunity for more general comment. Question 6 inquired on the basis of the past year's programs what the medical educators felt might be done better. Nine educators did not respond, but ten others
of the teachers to its goals. Various measures to provide continuing audience criticism should be designed.

Question 7 was the counterpart of Question 6 in that it sought ideas in conducting future programs which were not included in the first year's series. Again, nine teachers did not respond. The remaining ten had a variety of recommendations. In two cases, pollees had the common denominator of urging the same speaker(s) appear two to three weeks in a row for what would be a more intensive treatment of subject matter. Again, in terms of programming, there is no particular problem in accomplishing such a suggestion. However, the need or desire for it would have to be evaluated by the medical school. What must not be lost sight of is the fact these two-way seminars are not intended primarily for the specialist, but for the general practitioner, who must be updated on a variety of medical problems and research. The remaining eight responses for future consideration are sufficiently clear and singular as to warrant no further comment. Here follow the ten specific responses.

1. I would like to see a short course of instruction in an organized fashion in which the same speaker appears two or three weeks in a row, answering questions which may have come up from previous broadcasts and then going on to new topics.

Perhaps such a formal course would have registration and approval from the Academy of General Practice.
2. Would there be any advantage of some continuity such as having one team do the program for three weeks running? ...Might be worth considering.

3. I have not seen entire schedule of programs, so I can't answer this--one meeting (pre-season) of participants might help answer this question.

4. Set up a room for Ohio State University house staff and students to hear. Would like to see a "Year's Highlights in Medical Advances" conclude the series.

5. Conference in Mexico or Canada--other schools are doing it.

6. TV. (2 responses)

7. Well done.

8. Have not considered.

9. The practice of taping the initial talks tends to make them a little stiff. This should be guarded against.

The final question on Form C invited additional general comments from the medical educators. Four of the nineteen respondents had no response to make and two wrote simply "none." The remaining thirteen emphasized divergent poles of reference in critical comment. Four of these thirteen endorsed the radio seminar idea and method. Another was undecided about their worth, and another merely expressed gratitude for the opportunity to comment. One respondent desired more information on similar efforts elsewhere one felt a bigger budget was needed one felt television was
better' and one recommended the network be expanded and the teaching method improved.

The three remaining responses go into somewhat more detail. In one case some suggestions were made for increasing what is called "feedback activity" or active two-way participation, including the possibility of the teacher's directing questions to the listening doctors. A second case seems closely related in that the medical educator complained of "feeling in the dark" about whether or not he had been "on the right track." This respondent admits, however, he often experiences this feeling with what he terms "live" lectures also. The conclusion would seem to be to investigate further the means for using the two-way method to greater advantage in bringing teacher and student together.

A final, more detailed, response questioned the value of having the programs broadcast and thus available to the public where "missing the point" might lead to what are termed "great misconceptions." This idea is the concern of every broadcaster. The implications are so far-reaching as to be never completely answerable. However, it may suffice to say that the 1962-1963 Ohio Medical Education Network programs produced not one known repercussion of this nature. Interview, correspondence, and review of available information on other similar programs confirms the conclusion that the FM broadcasting precipitates little or no adverse reaction from the general public. There are even some indications
that the reverse may be true. For laymen who can stick with
the highly technical nature of the programs, there seems to
be growing respect for and a more realistic understanding of
the medical profession's enormous problems. A stronger con­
clusion would require further study beyond the scope of this
investigation. The thirteen general comments on the first
year's seminars are noted below:

1. I'd be interested in knowing more about system, aims,
topics to be discussed and similar efforts elsewhere and
their experience/advice.

2. The theory is prevalent that active participation--
not just passive listening--encourages learning. Perhaps we
should ask questions of the audience? Possibly Dayton or
Mansfield could put on a program?

   I would avoid the "stick out your neck and let's
cut it off" approach--the prima donnas love it, most don't.

   A few controversial topics got rather dogmatic or
nebulous attention.

   In brief, encourage more feedback activity--
possibly even from one program to next.

   How about a "Calling Attention To" conclusion? A
   technique for highlighting new findings, medical activity,
   and listing reference sources at the conclusion of each
   program?

3. Need bigger budget.

4. I consider this a very desirable effort to bring us
into contact with the medical community.
It's also a very efficient and economic way of doing so. Planning and organization were excellent.

5. None, except that it was an excellent program.

6. TV is better.

7. Good show—should improve with age.

8. I would question the value of having the program open to the public. If a physician listening to the broadcast is capable of misinterpreting, or missing a point (as happens) the public would be likely to develop great misconceptions.

9. Within the limitations of being on the broadcasting rather than the receiving end of the program, I had a generally favorable impression of its usefulness.

The present format with outline, slides, etc., seems to be the nearest approach to closed circuit TV.

10. I have the feeling that this type of program goes over better in the rural communities, such as in New England, rather than a thickly populated state like Ohio.

11. Expand and improve the teaching method.

12. I felt like I was operating in the dark—no feedback to tell me whether I was getting my point across—and none afterwards to know whether I had been on the right track. This often happens with live lectures too, frankly.

13. Thank you for the opportunity to comment.

In partial review, then, this chapter has reported and analyzed data accumulated on the teaching side of an educational method, based on its first year of use.
Resources have been: an abstract of a tape-recorded conference of the "classroom" or hospital teachers, a completed questionnaire from this same group, and a completed questionnaire from most of the "studio teachers" or medical faculty from the Ohio State University. It will be recalled each of these last-mentioned participated in but one program of one hour in length.

Although the samples consulted have of necessity been small, the respondents have provided a wide basis for preliminary evaluation of the two-way medical seminars as viewed by the medical educator. The teacher, however, cannot function without reference to the learner. Therefore, the subsequent chapter will report and analyze the judgments of a sample of physicians who were learners by this method in its initial year.
general medicine. It would appear there might exist here some professional status involvement. Such error was thought also to perhaps exist in the specialty listing of obstetrics-gynecology. However, the significance of such a possibility is not deemed sufficient to warrant more precise checking.

TABLE 17

NUMBER OF PHYSICIANS IN GENERAL PRACTICE OR MAJOR SPECIALTY

<table>
<thead>
<tr>
<th>Medical Area</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL:..................................</td>
<td>85</td>
</tr>
<tr>
<td>SPECIAL:</td>
<td></td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>32</td>
</tr>
<tr>
<td>General Surgery</td>
<td>16</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>13</td>
</tr>
<tr>
<td>Obstetrics-Gynecology</td>
<td>9</td>
</tr>
<tr>
<td>Radiology</td>
<td>8</td>
</tr>
<tr>
<td>Pathology</td>
<td>7</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>5</td>
</tr>
</tbody>
</table>

Within the category, "Special," were two sub-specialty categories designated as "Medical" and "Surgical." These two categories represented but thirty-six attendees in ten different areas of medical practice. However, they demonstrate, along with the major specialties listed, the wide spectrum of interests served by the radio seminars. The total areas of medical practice reported equals 211. The eleven in excess of the two hundred reporting are due to the fact that eleven physicians listed a specialty as well as general practice.
CHAPTER VI

ANALYSIS OF DATA: THE LEARNER

With a return of 275 (slightly over 15 per cent), Form B\(^1\) provided broader bases for some conclusions. Two hundred of the 275 learning physicians returning Form B had attended one or more of the thirteen seminars at their hospitals. Two questionnaires were rejected as incomplete or irrelevant. The remaining seventy-three had not attended any classes at their hospitals although many had heard one or more programs by radio. Nevertheless, the seventy-three were not tabulated beyond Question Number 4 regarding attendance, since it was decided the best evaluation could come only from those who could take advantage of the slides, written material, and submit questions.

General information on the two hundred attendees from Form B, Question 1, showed that over 50 per cent reporting were in general practice or internal medicine. Although "internal medicine" was indicated by reporting physicians under the item, "Special," consultation by this investigator with College of Medicine personnel led to the conclusion that many or most of these would also fall in the category of

\(^1\)Sample questionnaire of Form B appears on pp. 184-86 in Appendix.
The second question on Form E suggests a balanced distribution of respondents among the hospitals participating in the 1962-1963 Medical Education Network. Proportionate reporting from the twelve hospitals of the network seemed consistent with size of hospital. Dayton Miami Valley had forty-three attendees reporting, while the smallest hospital, Urbana Mercy, had seven. The remaining ten network hospitals were distributed in between seven and forty-three in number of attending respondents, and twelve attendees listed four hospitals outside the network as their staff hospitals. It must be noted that a number of respondents listed more than one hospital. Thus the total of hospitals reported equals 239, rather than 200. Four questionnaires had no response. The eight respondents who indicated a hospital other than one which was a member of the network may be

<table>
<thead>
<tr>
<th>Medical Area</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgical Sub-Specialties:</strong></td>
<td></td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>6</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>5</td>
</tr>
<tr>
<td>Urology</td>
<td>5</td>
</tr>
<tr>
<td>Oral Surgery</td>
<td>4</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>4</td>
</tr>
<tr>
<td>Thoracic Surgery</td>
<td>3</td>
</tr>
<tr>
<td>Doctor, Dental Surgery</td>
<td>1</td>
</tr>
<tr>
<td><strong>Medical Sub-Specialties:</strong></td>
<td></td>
</tr>
<tr>
<td>Dermatology</td>
<td>4</td>
</tr>
<tr>
<td>Aerospace Medicine</td>
<td>3</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>1</td>
</tr>
</tbody>
</table>
presumed to have had staff privilege with one, or to have
made arrangements to participate in the broadcast program
there.

TABLE 19

NUMBER OF PHYSICIANS IN ATTENDANCE AT
LEAST ONCE IN EACH HOSPITAL

<table>
<thead>
<tr>
<th>Network Hospital</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dayton, Miami Valley</td>
<td>43</td>
</tr>
<tr>
<td>Dayton, Good Samaritan</td>
<td>35</td>
</tr>
<tr>
<td>Springfield City</td>
<td>22</td>
</tr>
<tr>
<td>Lancaster, Fairfield</td>
<td>20</td>
</tr>
<tr>
<td>Springfield Mercy</td>
<td>20</td>
</tr>
<tr>
<td>Dayton, St. Elizabeth</td>
<td>19</td>
</tr>
<tr>
<td>Wright-Patterson A.F.B.</td>
<td>18</td>
</tr>
<tr>
<td>Newark City</td>
<td>15</td>
</tr>
<tr>
<td>Marion General</td>
<td>12</td>
</tr>
<tr>
<td>Chillicothe General</td>
<td>12</td>
</tr>
<tr>
<td>Picua Memorial</td>
<td>11</td>
</tr>
<tr>
<td>Urbana Mercy Memorial</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-Network Hospital</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidney, Wilson Memorial</td>
<td>4</td>
</tr>
<tr>
<td>Barnesville, Community Memorial</td>
<td>2</td>
</tr>
<tr>
<td>Chillicothe, Mt. Logan Samaritan</td>
<td>1</td>
</tr>
<tr>
<td>Newark, Licking County Memorial</td>
<td>1</td>
</tr>
</tbody>
</table>

Since the present two hundred respondents being re­ported here were isolated by means of Question Number 4 on
Form B, Question 3 is rendered self-obvious, since it
queried whether or not any of the seminars were heard. It
was placed in the questionnaire to help the pollee be clear
in just what he was answering, and to make possible the isola­tion of a group who had actually attended one or more of the
seminars at a hospital.
two-thirds were never registered for credit. However, almost 17 per cent were registered for credit for from ten to the total of thirteen programs. The other ranges of credit attendance may be noted below.

**TABLE 21**

**REPORT OF FREQUENCY OF REGISTRATION FOR AAGP CREDIT BY PHYSICIANS PARTICIPATING AT LOCAL HOSPITALS**

<table>
<thead>
<tr>
<th>Credit Attendances</th>
<th>Physicians Reporting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>136</td>
<td>68</td>
</tr>
<tr>
<td>1-3</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>4-6</td>
<td>13</td>
<td>6.5</td>
</tr>
<tr>
<td>7-9</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>10-12</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

The low attendance for credit reported above may partially be explained by the fact that at best estimate only twenty to thirty per cent of all physicians in the United States are members of the Academy. Furthermore, added comments such as "don't need it," "already have enough" made it evident credit was not a major motive for attendance for a considerable number of respondents. To attempt further explanation or analysis of reasons would go beyond the scope of this study.

Question 5 on Form B sought some information on sources whereby respondents first learned of the two-way
Thus, Question 4 reveals a total of 1,371 attendances by the two hundred physicians reporting. The mean average attendance of the thirteen programs was 6.86 programs attended per physician reporting. A more revealing profile of attendance is evident by breaking down the frequencies of attendance into five ranges of distribution, as below. It is readily observed nearly 25 per cent of the physicians attended one to three programs, 25 per cent, four to six programs, and 25 per cent, ten to twelve programs, with 6 per cent attending all thirteen programs.

**TABLE 20**

**REPORT OF FREQUENCY OF ATTENDANCE BY PHYSICIANS PARTICIPATING AT LOCAL HOSPITALS**

<table>
<thead>
<tr>
<th>Programs Attended</th>
<th>Physicians Reporting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>49</td>
<td>25</td>
</tr>
<tr>
<td>4-6</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>7-9</td>
<td>39</td>
<td>19</td>
</tr>
<tr>
<td>10-12</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Question 6 on Form B took this measurement one step further by inquiring of those who attended one or more programs how many times they were registered for the one hour per program credit authorized by the American Academy of General Practice. Analysis of the response revealed that
radio programs for medical education. Only four pollees did not respond to this question. Of the six choices available to the respondent as possible sources, the two most frequently indicated were: "director of medical education," and "publicity." Each of these items revealed nearly twice as many responses as any of the others.

The remaining four items and the frequency of response thereto may be seen below. The small number of responses indicating the item, "hearing it on the air," is somewhat understandable since the chance for accidental tuning in on a program is small. Appearing under the item "other" were such things as staff and medical society meetings (ten responses) and specific names (Dr. Prior, four responses; Dr. Frank Richardson, Philadelphia). Remaining nine responses in this item of "other" sources were unclassifiable. Here again, the total responses (234) exceed the number of respondents, since some marked more than one item. Initial information sources indicated on questionnaires are listed below:

From a director of medical education . . . 77
From publicity . . . . . . . . . . . . . . . 66
From a fellow physician . . . . . . . . . 37
From an administrator. . . . . . . . . . 25
Other sources . . . . . . . . . . . . . . . 24
No Response . . . . . . . . . . . . . . . 4
Only tentative conclusions can be drawn from these findings since the items are somewhat ambiguous. For example, an administrator, a director of medical education, and a fellow physician could be one and the same person, depending on the hospital. It may be helpful to conclude that general publicity through medical education outlets would seem to be a most fruitful source for making physicians aware of this learning opportunity.

Questions 7 through 19 on Form E provide data of a more critical than quantitative nature. Questions 7 through 17 were on a four-point scale while questions 18 and 19 were on a three-point scale. In order to analyze the consistency of answers, the questionnaires were randomly divided into two groups of one hundred respondents each. The two groups were tabulated separately to note the frequency of answers by specific choices in each question. A correlation between the two groups to determine consistency of response was run, which resulted in a rank order correlation of +.98 on answers to the thirteen questions.

This high consistency of response permits the conclusion that a similarly high consistency would probably be the case regardless of how many additional respondents were included in a similar sample. It is further possible to infer that the other ten questions on Form E have probably been answered with a high degree of consistency.

Having tested and established the homogeneity of
TABLE 22

FREQUENCY OF REPORT ON SATISFACTION WITH PROGRAM RECEPTION IN LOCAL HOSPITAL--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>35</td>
<td>17.5</td>
</tr>
<tr>
<td>Always</td>
<td>163</td>
<td>81.5</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

TABLE 23

FREQUENCY OF REPORT OF INTERRUPTIONS BY CALLS, NOISE, PEOPLE, ETC., DURING PROGRAMS AT LOCAL HOSPITAL--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>65</td>
<td>32.5</td>
</tr>
<tr>
<td>Seldom</td>
<td>123</td>
<td>61.5</td>
</tr>
<tr>
<td>Frequently</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No Response</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
the sample of two hundred respondents, the findings of Questions 7 through 19 will be reported in commentary and tables. It will be noted that with minor changes in wording and placement in the questionnaire, most of these same questions appear in Form A. Thus the findings permit a degree of cross reference and, in some cases, reinforcement of possible conclusions.

Questions 7 and 8 on Form B sought data on how the learner, or attending physician, would rate the physical and technical factors in using the programs. In answer to the query of how often radio reception at the local hospital was satisfactory, 99 per cent responded "always" or "frequently," with over 80 per cent stipulating "always." It may be suggested that some who indicated "frequently" as against "always" may have done so because of attending but a few programs. On the other hand, for the same reason, some may have indicated "always." Nonetheless, radio reception of the medical programs seems to have a strong endorsement.

Still concerned with physical factors, Question 8 on Form B raised the problem of how often hospital classes were interrupted by such things as noise, calls, or people. Again, data revealed a highly desirable situation, with 94 per cent of respondents indicating such interruption was "seldom" or "never" the case. From the learner's viewpoint, it would appear the two-way method is consistent with a satisfactory atmosphere for learning, and is practicable in a variety of hospital situations, physically and otherwise.
Questions 9 through 14 dealt with specific elements of each program. Questions 9 and 10 concentrated on the lecture portions of the programs. The former sought reaction on how often the lectures were thought to take up too much time. In response, over 95 per cent of the learning physicians felt the lecture portions were "never" or "seldom" excessive in length. Nearly two-thirds of these responses were in the class of "never." Such endorsement of the twenty-minute lecture portion would seem to suggest, by logical inference, satisfaction with the time allowed for questions and answers (about 35 minutes).

**TABLE 24**

**FREQUENCY OF REPORT ON EXCESSIVE LENGTH OF LECTURE PORTIONS OF MEDICAL PROGRAMS--FORM B**

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>129</td>
<td>64.5</td>
</tr>
<tr>
<td>Seldom</td>
<td>62</td>
<td>31</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No Response</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Question 10 on Form B was concerned with the learner's opinion on how well the lectures had been prepared by the medical educators. Over 60 per cent felt the talks were "always" well prepared. Over one-third, however, indicated
"frequently." Conceivably, relative meaning and frequency of attendance may cloud the significance of the item "frequently," but question can legitimately be raised whether there is not room for some improvement in lecture preparation. It is possible some clues may appear in the general questions at the conclusion of Form B.

**TABLE 25**

FREQUENCY OF REPORT OF SATISFACTION WITH APPARENT LECTURE PREPARATION--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Occasionally</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Frequently</td>
<td>74</td>
<td>37</td>
</tr>
<tr>
<td>Always</td>
<td>123</td>
<td>61.5</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

A final aspect of the lecture portions was evaluated by Question 11. Here, pollees were asked to rate the frequency with which they felt the lecturers communicated their material well. Over 97 per cent responded "most" or "all" of the time. Although the major implication here is, of course, voice, delivery, and presentation in general, an underlying suggestion applies to preparation. Thus, the approval given in the findings of the preceding table may be given somewhat more weight.
only "to some extent," "very little," or had no response.

A clue appears in a comment making general criticisms in response to the final four questions on Form B. The respondent stated: "For several lectures, slides were not available." The respondent's questionnaire listed Wright-Patterson as his hospital. It would appear then that in at least one hospital of the network, regular use of slides with the programs could not form the basis for assessing their value. It is doubted this phenomenon of non-use of slides is widespread. Causes could include late mailing, slow mail delivery, even intentional or accidental failure to use at the local hospital. No firm conclusions are possible on the causative factors. However, it is suggested that some more critical inquiry be made in future programs about (a) the need for slides, (b) the appropriateness of slides, and (c) the actual use of slides.

TABLE 27
FREQUENCY OF REPORT ON DEGREE TO WHICH USE OF SLIDES HELPFUL TO PROGRAMS IN LOCAL HOSPITAL--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very little</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>To some extent</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>For the most part</td>
<td>77</td>
<td>38.5</td>
</tr>
<tr>
<td>Very much</td>
<td>76</td>
<td>38</td>
</tr>
<tr>
<td>No Response</td>
<td>13</td>
<td>6.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
TABLE 26

FREQUENCY OF REPORT ON SATISFACTION WITH GOOD COMMUNICATION OF LECTURE MATERIAL BY TEACHING PHYSICIANS--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the time</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Part of the time</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Most of the time</td>
<td>156</td>
<td>78</td>
</tr>
<tr>
<td>All of the time</td>
<td>39</td>
<td>19.5</td>
</tr>
<tr>
<td>No Response</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

The degree to which the use of slides was of "real help" to the programs was the subject of Question 12 on Form B. Although thirteen questionnaires were tabulated as "no response" to this question, there were three physicians who, while not making a choice, wrote brief comments, as follows: (1) "Missed them, don't know"; (2) "Can't remember seeing them"; and (3) "None were used at the two programs I attended." It is known that slides were distributed for use with all thirteen programs. The question, why, may logically be raised. Further support for concern arises when it is noted that the "no responses" on this question were nearly twice as frequent as on any of the others of this group (Questions 7 through 19), which were structured similarly. Moreover, while over 76 per cent of respondents rated the helpfulness of the slides as either "very much" or "for the most part," over 23 per cent judged them as helpful.
As was done on Form A, Question 14 on Form B sought from pollees an indication of how often questions were thought to have been well answered on the programs. More favorable unanimity occurs in this area. 96 per cent of respondents were satisfied with answers to their questions either "regularly" or "frequently," with 50 per cent stipulating "regularly." Again, this satisfaction is in agreement with feelings expressed by the hospital moderators on the same question in Form A. 3

TABLE 29

FREQUENCY OF REPORT OF WELL-ANSWERED QUESTIONS ASKED FROM LOCAL HOSPITAL--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seldom</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Occasionally</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Frequently</td>
<td>92</td>
<td>46</td>
</tr>
<tr>
<td>Regularly</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Questions 15 and 16 on Form B sought to gain information on possible effects of the two-way medical programs on the learner. Question 15 asked how often the physician consulted reference works, journals, and the like, previous to participating in the radio programs. Question 16 called for

3 See p. 86.
Another element of the programs produced a rather wide distribution of opinion in Question 13 of Form B. Here, learning physicians were queried regarding the printed outlines of the talks, which were distributed in advance of each program. Respondents were asked to indicate how frequently the outlines were detailed enough to be of reference value after the programs had been broadcast. Although better than 50 per cent of the pollees responded with "frequently" or "always," 43 per cent felt the outlines were sufficient for reference only "occasionally" or "seldom." These findings strongly confirm those on Form A by the hospital moderators in answer to the same question, and give further support to the oral recommendations made by them. Moreover, general comments evaluated later in Form B lead to the same conclusion that a more thorough job needs be done in the preparation of outlines for the topics.

TABLE 28
FREQUENCY OF REPORT ON LECTURE OUTLINES BEING DETAILED ENOUGH TO BE OF REFERENCE VALUE AFTER THE PROGRAMS--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seldom</td>
<td>31</td>
<td>15.5</td>
</tr>
<tr>
<td>Occasionally</td>
<td>55</td>
<td>27.5</td>
</tr>
<tr>
<td>Frequently</td>
<td>73</td>
<td>36.5</td>
</tr>
<tr>
<td>Always</td>
<td>34</td>
<td>17.0</td>
</tr>
<tr>
<td>No Response</td>
<td>7</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Total 200 100

1See p. 84. 2See p. 75.
TABLE 30
FREQUENCY OF REPORT OF USE BY PHYSICIANS OF REFERENCE MATERIALS PREVIOUS TO RADIO SEMINARS

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seldom</td>
<td>33</td>
<td>16.5</td>
</tr>
<tr>
<td>Occasionally</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Frequently</td>
<td>77</td>
<td>38.5</td>
</tr>
<tr>
<td>Regularly</td>
<td>57</td>
<td>28.5</td>
</tr>
<tr>
<td>No Response</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE 31
FREQUENCY OF REPORT OF INCREASE IN USE OF REFERENCE MATERIALS FOLLOWING RADIO SEMINARS

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very little</td>
<td>97</td>
<td>48.5</td>
</tr>
<tr>
<td>To some extent</td>
<td>82</td>
<td>41</td>
</tr>
<tr>
<td>To considerable extent</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td>Very much</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>No Response</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

The final three questions (17, 18, 19) in this short-answer grouping on Form B sought more general evaluation of the programs by the learning physician and some declaration of his intention regarding possible future use of such a
a judgment on the extent to which the radio seminars increased this reference activity.

Nearly one-third of the reporting physicians responded they consulted references and journals previous to these radio courses "occasionally" or "seldom," and over 48 per cent felt the seminars increased such consultation "very little." Also, two-thirds of the responses showed this reference activity to be performed "frequently" or "regularly" previous to the radio courses. On the other hand, it may be significant that over 50 per cent of the learners felt reference reading was increased by the programs, with 10 per cent in the categories of "very much" and "to considerable extent."

It would appear, then, that the extent of increase in reference use, produced by the medical programs, is small. This is perhaps to be expected in the light of the problems of time and multiplicity of printer matter reviewed in Chapter 1. Nonetheless, these data reveal also that better than one out of two of these attending physicians felt their reference work was increased to some degree by the radio programs. Whether the stimulation has been to the physician who reads often or seldom seems beside the point. Too many other factors are involved. More significant perhaps is the fact the two-way medical programs seem to be giving some impetus and direction to the practicing physician in an area where he is already overburdened.
TABLE 33

FREQUENCY OF REPORT OF WHETHER OR NOT TWO-WAY PROGRAMS OFFER OPPORTUNITIES NOT OTHERWISE AVAILABLE TO PHYSICIANS--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>149</td>
<td>74.5</td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Don't know</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Medical programs were offered the next year. A nearly unanimous number of the learning physicians (96.5 per cent) responded "yes," they would attend.

TABLE 34

FREQUENCY OF REPORT OF INTENTION TO ATTEND MEDICAL PROGRAMS IF OFFERED IN FUTURE

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>193</td>
<td>96.5</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Don't know</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

In summary, then, Questions 7 through 19 on Form B would seem to constitute a strong overall endorsement of the idea and the conduct of the two-way medical seminar programs.
service. Question 17 asked the pollee to rate on a four-point scale the effectiveness of these seminars for post-graduate medical education by comparison with other teaching aids used in his hospital. A resounding response of 90 percent noted the programs "excellent" or "good," with nearly one-third in the top rating of "excellent."

TABLE 32

FREQUENCY OF REPORT OF RATING EFFECTIVENESS OF TWO-WAY PROGRAMS COMPARED WITH OTHER TEACHING AIDS IN THE LOCAL HOSPITAL--FORM B

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Fair</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td>Good</td>
<td>115</td>
<td>57.5</td>
</tr>
<tr>
<td>Excellent</td>
<td>65</td>
<td>32.5</td>
</tr>
<tr>
<td>No Response</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Question 18 pressed program acceptance somewhat further by inviting a more direct response to whether or not the programs offer opportunities for learning otherwise not available to the physician. Four out of five pollees marked "yes." The programs appear to be filling a definite need.

The filling of a need seems further confirmed by the findings reported on Question 19 of Form B which asked if the pollee would plan to attend if a similar set of
thorough in detail"; "more practical"; "more therapeutic"; "more general practice"; and "more clinical."

It will be recalled this thread of more basic and practical subject matter has been endorsed throughout the preceding chapter as well as here by both educator and learner. Four responses felt the past year's topics had been selected well, and two suggested they be more technical in the sense of avoiding oversimplification. It would seem these latter two responses do not conflict with the widespread emphasis on being more practical. However, this last conclusion can only be a tentative one.

Moving from a report of the data of a generalized nature pertaining to program topics to more specific recommendations for future subject areas, six sub-categories were set up into which the recommendations on topics seem best classified. They are (1) Diagnosis, (2) Treatment, (3) Diseases, (4) Pain or Injuries, (5) Generic, and (6) General Interest and Miscellaneous.

Responses were classified in one of the six sub-categories in accordance with apparent emphasis or approach given by the reporting physician. Where a recommendation classified under one sub-category could conceivably have been listed under another sub-category, placement was determined by what this investigator felt to be the strongest concern of the reporting physician.

Twenty-one responses recommended topics which should be approached from the viewpoint of Diagnosis (Dx). Those
A few questions have arisen centering particularly around mechanics and elements of the programs. Some further evaluation is possible as the result of tabulating the final four questions on Form B.

Questions 20 through 23 were open-end, and, as such, produced a widely varied response both in subject matter and style. The most feasible plan of analysis seemed to be to lump the four questions together and then catalog the answer material according to areas of emphasis. The questions were as follows:

20. What was done this past year which you feel could be done better?

21. What was not attempted this past year which you feel should be tried?

22. What topics would you recommend be considered for future medical courses on two-way radio?

23. What general comments would you care to make?

Three major areas became evident as practical for listing and tabulation: (1) Recommendations and Criticisms on Topics for Future Programs, (2) Recommendations and Criticisms of Program Elements, and (3) General Recommendations and Criticisms.

Regarding topics desired for future programs a number of responses were of a general nature rather than specifically indicating subject matter. Thirty-five responses were catalogued in which the central recommendation was that topics be made more specific, including such comment as "more
The remaining twenty-seven topic suggestions which emphasize Treatment are as follows:

More lectures on treatment; more discussion on treatment; asthma; newborn care; anesthesia; medico-surgical Rx; radioactive material in medicine; anti-coagulants in coronary thrombosis; radioisotopes; radiation therapy (supervoltage); gastric freezing; plastic surgery; arteriosclerosis; intravenous fluid therapy; cardiac arrhythmias; newborn syphilis; newborn neurological problems; newborn resuscitation; research and clinical findings on drug detoxification; management—minor illness (home and office); physiotherapy in strokes; care of stroke patient; management of sudden, acute and severely ill patient; care of Rh baby; care of premature babies; transfusion dangers and safeguards; and pre-operative care.

A third sub-category for topic recommendations seemed distinguished by mention of Diseases themselves. Six disease areas received more than one response, for a total of twenty-six responses, as follows:

Heart (cardio-vascular, rheumatic, strokes). 6
Malignant (carcinoma). 6
Collagen, rheumatoid and arthritic . 5
Respiratory (lungs, emphysema, tuberculosis). 5
Acne, dermatitis . 2
Medical disease of kidney . 2
(Renal tubular avidoses)
having more than one response appear below, with indication of number of responses.

Lab work for offices ...................... 4
Lab Techniques ............................. 2
Cardio-Vascular Tips ..................... 2

The remaining thirteen responses emphasizing Diagnosis were as follows:

Malabsorption Syndromes; newborn syphilis, newborn neurological problems; general aids; elaborate techniques; arteriosclerosis; differential Dx on jaundice; differential Dx; indigestion syndrome; differential Dx of early psychosis; identification and management of suicidal risk patient; radioisotopes; differential diagnosis of commonly encountered clinical problems.

Forty-three responses were classified under the subcategory of topics dealing with Treatment (Rx). Six of these were mentioned more than once. Listed below with number of responses, they are:

Post-operative care and fluid balance .................. 4
Dermatology .................................. 3
Obstetrics .................................. 3
Surgery ....................................... 2
Preventive medicine ............................ 2
Chemotherapy ................................. 2
Psychiatry .................. 4
Dermatology .................. 3
Chemistry .................. 3
Neurology .................. 2
Pathology .................. 2
Urology .................. 2
Internal Medicine ............ 2
Metabolism .................. 2

The remaining ten single responses were as follows:

Endocrinology; hematology; immunohematology; radiology and x-ray; medical genetics; proctology; medical-neurology; geriatrics; aviation medicine; and occupational medicine.

The final sub-category for responses suggesting topics has been labeled General Interest and Miscellaneous. Although the responses were varied and, in some cases, difficult to interpret, they are listed along with their frequency of response so that the record may be complete. Four items received more than one response. They are as follows:

Recent advances, progress talks ........ 4
Clinical pathological conference .......... 4
Controversial topics .................... 3
Office techniques ..................... 2

The remaining ten responses are as follows:

Medical writing and communication; emergency room
The remaining ten responses each suggested a different disease. Listed, they are:

Anemias; dermatosis; acidosis; hepatic disorders; hypersplenism; pathophysiology of allergy; nephritis with nephrotic syndrome; coagulation defects; psychosomatic illness; and Hodgkin's Disease.

There were but seven responses noted which expressed desire for topics dealing with Pain or Injuries. Two desired discussion of pain in the back. The remaining five responses were as follows:

Burns, treatment of; [Here again, context of the reporting physician's remarks suggested more concern with "burns" rather than treatment, thus the classification here] traumatic injuries (head and neck); brain injuries; foot problems; acute chest pain.

A fifth sub-category for topic recommendations has been labeled Generic for the purpose of reporting those suggestions for topics characterized by mention of a broader area of medical practice or study. Sixty-five responses were catalogued here; and fifty-seven were distributed among fourteen subject areas:

Pharmacology .................. 12
Physiology ........................ 6
Pediatrics ........................ 6
Basic Science ...................... 5
Orthopedics ....................... 4
Obstetrics ........................ 4
management and patient care; personal profile of continuing education; any subject well prepared; general medicine; legal medicine; general interest topics; history; development of a concept; and the statement: "It's difficult—general interest topics."

Recommendations and Criticisms of Program Elements of the medical seminars constitute the second major category into which answers to the final four questions on Form B were collected. Analysis and cataloging soon reveal that these responses concerned themselves mainly with outlines, slides, lectures, and question and answer periods. Regarding outlines, eleven responses were noted which recommended the outlines be more specific in detail and contain reference for future study. Another response suggested a bibliographical summary be included. Three responses felt the outlines should be mailed earlier, and one respondent raised the question of whether the outlines could be distributed to all physicians in the listening area. A final recommendation on outlines stated they should be presented to the class before each session. Several of these suggestions are dependent on factors at the local hospital as well as at the university. It is therefore difficult to ascertain their degree of significance. It is however possible to observe again the strong emphasis in these free responses on making the outlines more useful during and following the programs.
In reference to the slides used on each program, five responses indicated desire for more illustrations or pictorial material. An additional response recommended there be less charts, and another recommended more graphs be made into slides. A final response suggested pictures be included in the outlines rather than having slides sent. This last suggestion, it is believed, would reduce some of the effectiveness of the conduct of the program at the local hospital. Moreover, it is known to be possible the hospitals can arrange to have copies of the slides made and kept for their own use. It would seem this might include the making of printed photos. If, however, this much trouble is gone to, it would seem better merely to publish slides and lectures in journal form, again negating the two-way value of the medical seminars.

The program lectures were the subject of some response and difference of opinion. Seven responses felt more time should be spent on the lectures, while one recommended less time devoted thereto. An additional one suggested eliminating the lectures altogether. Twice the response was noted that the lectures were too general. Two respondents felt fewer statistics should be used. A final response recommended that the lecturer present his own findings and not resort to a digest of literature. The responses regarding the use of statistics and disadvising making the lectures a digest of literature may be of some value to
Radio for this measure. A final response recommended that reasons for answers to questions be given, which seems to mean more explanation and justification for the answers given. Concluding responses relevant to the presentation of the seminars were three responses which endorsed having more discussions with varying viewpoints. Two other responses indicated a desire for more discussion by personnel from the Center for Continuing Medical Education. The frequency of the seminar broadcast was the subject of three final responses in this area. Two responses preferred one program every two weeks, and one recommended the programs be broadcast once each week.

The third and final category established for cataloging the answers to Questions 20 through 23 has been designated as General Recommendations and Criticisms. A listing of these follows with a designation of the number of responses:

Valuable--well done.......................83
Time and distance difficulty.............6
Want closed circuit TV...................4
Less hospitals per program..............4
Want open circuit TV....................2
Too cut and dried (no controversy).....2
Clinical demonstrations of cases........2
Radio little value--money better spent ..2
Better promotion and publicity..........2
the medical educator. However, it is beyond the scope of this investigator to attempt to critically evaluate such suggestions. The remaining responses do find an interesting counterpart in the free responses catalogued under the program element of the Questions.

Under Questions, ten responses were noted in which participating physicians felt less time should be allowed. This view would seem to harmonize with the seven in the preceding element who felt more time should be given to lectures. However, four other responses catalogued under Questions commented that more time should be allowed, and another recommended there be questions and answers alone, with no lecture. One respondent wished the questions eliminated.

It would appear opinion is almost equally divided and minimal in free response. Therefore, the findings drawn earlier in this chapter indicating general satisfaction with the lectures and the question and answer period are justified.

Four responses were concerned with some aspect of refining the questions themselves. Two of these recommended stronger limitation on the number of questions permitted each hospital; a third recommended they be less repetitious; and the final response felt questions should be sent in advance and screened. It was not clear whether the respondent meant to the local hospital moderator or to WOSU
Some topics, two weeks ...................... 2

The remaining single responses are:

Better questioning technique (by hospitals); program at another time; no clinical pathological correlation; last minute reminders of time and place (intra-hospital); attendance spotty--my own fault; choose better speakers; moderators, more active role; advance publicity--more references for reading; printed schedule several weeks in advance of what program is to be; don't like open broadcast; bad, but listens to most in office [convenience]; have programs made more basic to everyday practice; attendance fluctuated due to topics; should repeat questions from hospital when indistinct; visiting specialists brought in; for several lectures, slides not available [Wright-Patterson]; have one session where questions and answers are sent in advance on technique, equipment, procedures; directly, programs offer small amount, while indirectly, they are stimulus for reading and seeking new or different references; mimeograph or print summary of courses for permanent reference; Thursday a better day for many doctors; our internes not stimulated as we thought they would be; improve [remedy] acoustical feedback from answering hospitals; wish I had attended them all.

In summary, then, the preceding chapter has reported and analyzed the responses of two hundred physicians who participated as learners in the two-way medical programs.
These data are obtained from Form B questionnaire. The findings seem to give strong approval of this educational method. The preponderance of findings suggest little need for radical change in the present mode of offering. However, numerous helpful suggestions are provided. Responses are noted which give guidelines for the improvement of some of the elements of the programs, the subject matter, and how this subject matter might be approached by the medical educator. Findings which confirm or dispute findings on similar questions asked of the medical educator in Form A have been noted, and preliminary conclusions drawn.

It will remain for the succeeding chapter to consolidate these preliminary findings and relate them to the background and general objectives of this present study.

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1 It will be recalled that seventy-three of the 275 questionnaires returned were not used for tabulation, since the respondents indicated they had not attended one or more of the radio seminars at a hospital. However, the information made available by each respondent on Questions 1 through 4 was assembled and is included in the Appendix, pp. 190-93. Moreover, all unsolicited remarks of these non-attending physicians have been assembled as well as three responses, in their entirety, which were distinctively atypical and negative in character. No analysis or reaching of conclusions is attempted on these data, since they have been ruled out of the present study. The data have been included, however, so that the report might be complete and available for future research.
of acceptance of this method by teacher and learner and provide some bases for rejecting, modifying, or confirming certain elements of the programs whereby the method might be improved. It was felt the most vital data could be obtained from those who taught and learned by the radio seminars. Therefore, mail questionnaires were constructed which would encourage quick but thorough response from those best qualified to judge.

Return of the questionnaires from moderators who implemented and conducted the two-way programs at each local hospital was 100 per cent. Of the University Medical School faculty who taught the radio seminars, 76 per cent responded. It will be recalled that over 15 per cent of the learning physicians, or 275 of a possible 1,150, responded to the third questionnaire. Much more significant here, however, is the fact that two hundred of the 275 had attended one or more of the radio classes at their hospital. When physicians' names on attendance cards reveal that 416 individuals attended one or more programs, the group of two hundred attendees represents a response of nearly 50 per cent of those best qualified to make critical judgments on the two-way seminars.

Findings obtained from a tape recorded discussion by Ohio State University personnel and medical educators from outlying hospitals, together with the three separate sets of mail questionnaires, produce a composite profile of the two-way educational method upon which some observations may
CHAPTER VII

SUMMARY AND CONCLUSIONS

In review, this investigator has sought to develop a body of information on the need for and the effectiveness of an educational method. Basically descriptive, the study's findings have been derived by two major approaches. One has been to examine the need for continuing medical education by the practicing physician and how this need has been and is being met, with particular reference to FM radio broadcasting as a feasible tool for the educator. Problems, isolated and interrelated, of the medical educator and the educational broadcaster have been detailed. A review of the literature has pinpointed the importance of an exchange of ideas between teacher and learner, and has supported the consideration of a two-way radio-telephone network as a practical recognition of this importance. A detailed report of the initial academic year's use of the two-way broadcast seminars at the Ohio State University has completed the framework within which to conduct critical analysis.

The second major approach of this study has been to devise a plan for researching the thirteen two-way medical programs conducted at the Ohio State University during 1962-1963. The plan was designed to produce findings which, though preliminary, would give some systematic indications.
following facts. Radio reception was always satisfactory for 80 per cent of those reporting. The classroom atmosphere was conducive to learning as affirmed by the report of 94 per cent of the attending physicians who felt that their classes were seldom or never interrupted by extraneous noise or people. Nine out of ten of the learning physicians rated the effectiveness of the two-way seminars either excellent or good when compared with other teaching aids in their local hospital, and four out of five felt the radio programs offered opportunities for learning which would not be otherwise available to them. Acceptance of this method by teacher and learner and the fact the programs meet an existing need seem conclusively confirmed.

Investigation of the elements at work in the broadcast seminars highlights strong and weak points and gives some direction for possible change and improvement. The lecture portions of the programs were appraised by both teachers and learners. Hospital moderators were nearly unanimous in feeling the lectures were well communicated and well prepared, and sixteen of the seventeen reporting felt the talks were either never or seldom too long. On the learning side, 95 per cent of the two hundred attending physicians agreed the lectures were never or seldom excessive in length, with nearly two-thirds specifying "never." This group expressed approval of lecture preparation, with over 60 per cent feeling the talks were always well prepared, and
be made and from which some conclusions may be drawn. Classroom moderators, medical school faculty, and learning physicians all indicate strong acceptance of the two-way radio seminars as a method for providing continuing medical education. On the teaching side of the teaching-learning phenomenon, moderators at the local hospitals report good radio reception, simple utilization of the programs in the hospitals, and practically no interruptions to classroom atmosphere. Compared with other teaching aids and other learning experiences available to them, the hospital moderators rate the two-way seminars strongly superior.

Medical faculty from the Ohio State University, though each had experience with but one of the thirteen programs, judged the programs against the specific reference "as a method of instruction." Nearly two-thirds reporting give enthusiastic and detailed approval. The remainder are merely restrained or qualified, and none disapproves. Broadcast orientation to and preparation for the use of this method by the teacher are deemed adequate and not burdensome. Nearly two-thirds reporting felt there were no problems encountered in preparation, considering the program elements of lecture, outline, and the use of slides. These studio teachers were nearly unanimous in feeling the help given them in radio orientation to the two-way method was sufficient.

Confirmation of the foregoing opinions of teachers comes from the learning physicians as indicated by the
over 97 per cent felt the medical teachers communicated their lecture material well, either most or all of the time.

Less agreement and/or endorsement is evident in the findings regarding subsequent elements: lecture outlines; the use of slides; and the question-and-answer period. Findings relative to the lecture outlines give indications that a more thorough job should be done in the form and content of this printed material for use during and after the programs. During informal discussion, hospital moderators voiced feelings that the outlines should be more summary in nature and contain more specific bibliographic references. They confirm these recommendations on their questionnaires, where over one-third rated the outlines as seldom detailed enough to be of reference value following the programs. The two hundred learning physicians give additional weight to the foregoing criticism since 43 per cent stipulate the outlines were only seldom or occasionally detailed enough for reference use. Free response from both teachers and learners strongly emphasized the need for more specific detail, more reference sources, and summary treatment of the essential high points of the lecture itself.

The degree to which the use of slides was of genuine help to the programs was judged by both hospital moderators and attending physicians. Findings give evidence of a need for a closer look at the use of this visual aid in the two-way broadcasts. Fifteen of the seventeen hospital moderators
deemed the slides valuable either most of the time or very much. However, over 23 per cent of the two hundred learners judged them as helpful either very little or to some extent, or had no response. The fact that thirteen of the two hundred attending physicians did not respond to this question has been noted as being nearly double that of any other question dealing with program elements. Moreover, some free response has suggested the possibility, in the case of at least one hospital, that the slides were not used for several of the programs. The conclusions based on these findings cannot justifiably lead to rejection of the slides as a useless element, for over 76 per cent of the learners rated the slides helpful in the categories of either "very much" or "for the most part." There exist, however, sufficient grounds to warrant re-examination of the need, appropriateness, and actual use of the slides in terms of the goals of this educational method.

All three groups: hospital moderators, studio teachers, and learning physicians were consulted regarding the question-and-answer period as an element of the two-way seminars. Thirteen of the seventeen moderators felt questions were eagerly submitted by attending physicians either most or all of the time. Almost two-thirds of the studio teachers considered the calibre of questions asked of them as valuable, significant, and stimulating. Of the two hundred attending physicians 96 per cent were satisfied with the
answers to their questions either regularly or frequently. One out of two of these learners thought their questions were regularly well answered. In many ways this element is at the heart of the two-way method, and the conclusion of nearly complete success seems warranted.

Design of this study precluded extensive investigation of effects of the two-way medical seminars. However, findings do make possible some conclusions in two areas: (1) program follow-up inquiries and (2) consultation of journals and other reference materials. Slightly more than half of the nineteen university medical faculty reported some inquiry by letter, phone, or in person, following their programs. The number of inquiries received was in general minimal. Such a phenomenon might be interpreted as revealing little stimulation beyond the programs themselves. However, the same might be true if the programs were actually doing their job well.

Further probability is lent to the foregoing observation by the findings on two questions answered by the two hundred learning physicians. The data reveal that although nearly one-third of these learners consulted references and journals seldom or occasionally previous to the broadcasts, over 50 per cent felt reference reading was increased by the programs. Whether or not the two-way programs have stimulated the physician who already reads considerably seems less significant than the fact this method
does produce a modest increase. As noted in Chapter I, the practicing physician is nearly inundated with printed material which is often non-discriminatory. The selected references and emphasis given to certain medical problems by the seminars seem to provide the physician with impetus and direction for increasing his reference work.

Hospital moderators and learning physicians were asked to indicate their intentions to use and attend similar two-way programs if offered the next year. Results were most promising. All seventeen moderators indicated they would use the radio seminars again, and over 96 per cent of two hundred physicians stipulated they would attend. Only time and further investigation can confirm or reject the validity of these intentions.

Data have been collected in this study on the types of medical practice represented in the sample of attending physicians, frequencies of attendance with or without credit, distribution of hospitals represented, and publicity sources. Free response to open-end questions has been subjected to content analysis and categories have been

---

1With the academic year 1963-1964 currently in progress it is possible to note that the present Ohio Medical Education Network is made up of all twelve of the original hospitals plus twenty-four more in Ohio and West Virginia. Where in 1962-1963 the network served the twelve hospitals and the public with thirteen programs from two FM radio stations, the 1963-1964 network is serving thirty-six hospitals and involves sixty-three programs, using the facilities of eight FM radio stations, seven of which are commercial outlets. See Appendix E, p. 195.
practicing physicians can be provided with a continuing educational experience which is realistically accessible and convenient.

7. The two-way radio seminar method for providing continuing medical education is strongly accepted by both teacher and learner.

8. The two-way method preserves classroom atmosphere at hospitals by insuring reliable broadcast reception, simple utilization procedure, and absence of distraction while conducting the two-way programs.

9. The two-way seminars provide learning experiences not otherwise available to the participating physicians and provide a superior teaching tool not ordinarily available to the local hospital.

10. Adequate radio orientation for teachers on the medical programs is simple to accomplish and effective.

11. Teacher preparation of program elements such as slides, outlines, lectures, is achieved with minimal difficulty. However, ways should be constantly sought to improve these elements.

12. Topics for the programs should be kept at a practical level and should be selected and scheduled with continuing regard for the needs of the practicing physician.

13. Printed material in the form of the topic outlines should summarize the lecture content, be attuned to the general medical practice level, and contain pertinent bibliographic references.
established which suggest topics for future programs, criticize program elements, and make general comments or recommendations about the two-way method. This information has been analyzed and, where possible, related to the more specific findings of the study. The category of topics for future programs is best left to a curriculum committee of the Medical School for meaningful interpretation and recommended action.

The summarized results of the present study make possible the following conclusions.

1. There exists a growing need for the practicing physician to continue his education.

2. The two-way radio-telephone network as used in medical education is a technique for bringing together teacher and learner.

3. Experience with the two-way seminars in medical education has been limited primarily to continuing instruction for practicing physicians.

4. This method of instruction is particularly well suited to meet the needs of an educational program where the students are widely scattered and have numerous pressing demands on their time.

5. The two-way seminar can be used in a variety of ways depending only upon the network facilities, the educational objectives, the subject matter, and the participants.

6. With very modest expenditure in time and money,
APPENDIX A

CORRESPONDENCE PERTAINING TO DEVELOPMENT OF OHIO MEDICAL EDUCATION NETWORK AND PUBLISHED REPORT OF ACTIVITIES
14. The use of visual material in the form of slides should be re-examined in terms of need, appropriateness, and actual projection at hospitals in junction with the programs.

15. Lecture portions of each program should include personal testimony and experience as against academic detachment on the part of the lecturer.

16. Question-and-answer portions of the programs are the heart of each seminar, should not be cut short by too long a lecture presentation, and should be continuously researched for ways to increase meaningful participation.

17. More and better means of publicizing the medical seminars, particularly for the physician audience, should be sought by medical educator and broadcaster.

18. Continuing evaluation of the two-way radio method should take place by providing active liaison with local hospitals, a variety of critical feedback mechanisms, and a receptiveness to new ideas for improving and diversifying this educational tool.

A good start has been made on a most significant problem. It is believed the present study reveals that here is a method for providing continuing medical education which is educationally sound, flexible, accepted by teacher and learner, and which serves a definite and growing need in a practical and convenient way.
December 28, 1961

To: Bob Schweikart

Subject: Remote Transmitters

While we have not been able to conduct experimental test for the Medical College's proposed, remote participation program over our FM facilities, I have had the opportunity to discuss this with individuals who are presently engaged in vehicular and point-to-point FM communications, using Columbus as a central hub. Since the frequencies they are using are very nearly that which would be used in our proposal, it would seem that we could rely on their experiences for our purposes.

Their experience indicates a fairly reliable limit of 50 miles, if receiving antennas are placed appreciably higher than surrounding objects and/or terrain. In other words, a line-of-sight situation would provide a completely reliable signal. Beyond this the reliability decreases up to the fifty-mile point previously mentioned.

Point-to-point communications, beyond 50 miles, while possible, are not reliable. As a matter of fact, it is possible to work a distance of 100 miles, this however, is under ideal conditions and not on a year-around basis.

My sources of information, incidentally, represent considerable experience, since they are the chief communications engineers of various state and city departments and public utilities.

The terrain in Central Ohio unlike that in Massachusetts, which was used as an example, is not favorable for widespread remote participation as proposed. Columbus, in fact, is situated in a bowl, so to speak, so that line-of-sight transmission, which is necessary at these frequencies, is not possible beyond about 30 to 40 miles. Experience then indicates an additional 10 to 20 miles when receiving conditions are made more favorable.

I realize that this does not completely answer the questions that have been raised. However, it is the best that we can do under the circumstances.
TO: Mr. Richard B. Hull
FROM: Bob Schweikart
SUBJECT: Medical Education: Two-way Conferences
DATE: March 12, 1962

I began conversations with Dr. John Prior, of the OSU School of Medicine last October, about the possibility of a service to Medical Education similar to WAMC, Albany, N.Y.

He asked us to check out FM possibilities, but would not specify locations other than Mansfield, Cleveland and Chillicothe, as I remember.

Al Boggioni and I investigated. Al gave me a report on December 28, 1961, in which a 50-mile radius was the best reliable distance we could count on. The crux of the problem was in the low-power high frequency transmitters to be located at remote points, in hospitals, etc. (You will remember WAMC has a 150-mile radius due to tower height and location.) Their signal to us would be unreliable over 50 miles away.

We counter-proposed a 2-line loop network using Class D lines. Cost per line: 10¢ per hour per airline mile. Advantages:

1) Initial cost per hospital: amplifier, mike, and speaker: from $200 to $500 (no transmitter-receiver unit needed.)

2) Very little maintenance

3) No distance limit

4) No FCC licensing, logging, etc.

5) Each station pays only for its leg of network

6) Reliable quality

Prior was interested and agreed to get us list of locations from which we could give him a layout.

This brings us up to the phone call of today which, boiled down to what he said on the phone, was "wait until I see the Dean tomorrow."

I'll let you know as soon as anything breaks.

cc - Messrs: Ewing Boggioni
          Fuzy Davis
Dr. John A. Prior  
113 Hamilton Hall  
1645 Neil Avenue  
CAMPUS

Dear Dr. Prior:

After several meetings with the representative of the Ohio Bell Telephone Company, we are ready to recommend a plan for conducting post-graduate medical seminars through the joint facilities of WOSU-FM and Ohio Bell.

Briefly, the proposal is this:

1. Each receiving point would be equipped with an FM receiver capable of receiving WOSU-FM.

2. Each participating hospital would have a good quality microphone and broadcast pre-amplifier. Specifications would be drawn by Mr. Boggioni, WOSU chief engineer.

3. WOSU-FM would broadcast the presentation: the participants' statements, incoming questions and answers.

4. The Ohio Bell Telephone Company has agreed to provide, at their regular class "D" rates, audio lines from the receiving points to the WOSU-FM studio. (Note the attached example which indicates that the 10 month service for one Springfield hospital would be only $346.00.)

Costs to the participants for this two-way service would not be exorbitant:

a. The cost of "broadcast" equipment, (microphone and associated components located at the receiving hospital) is estimated at $200.00.
OSU Doctors Hold Medical Radio Talks

Two Ohio State University physicians will conduct the third in a series of postgraduate medical conferences via closed-circuit, two-way radio Friday between Columbus and the staffs of 12 hospitals in upstate New York and New England.

Dr. Robert M. Zollinger, professor and chairman of the department of surgery, and Dr. Dan W. Elliott, associate professor of surgery, will speak on "Ulcerogenic Tumors of the Pancreas and Management of Pancreatitis" in a program originating from Station WOSU on the Ohio State campus.

The program will be relayed by Albany, N. Y., Radio Station WAMC to hospitals in New York, Massachusetts and Connecticut.

After hearing Drs. Zollinger and Elliott, staff physicians sitting in on the radio conference in their respective hospitals may question the speakers and receive answers.

Drs. Zollinger and Elliott conducted similar conferences in the series Tuesday and Wednesday for 24 other upstate New York and New England hospitals.

The Ohio State University College of Medicine is planning to institute similar medical seminars for Ohio physicians.

_Columbus Dispatch_, April 4, 1962, p. 17A.
b. While the cost of receiving FM equipment would vary with terrain, distance from the WOSU-FM transmitter, height above sea level, type of antenna required, etc., costs are estimated in a range of $150.00 to $450.00. These items, of course, represent a one-time capital investment which would remain in use for many years.

In order to implement the cue system from the hospitals to the WOSU-FM control room, some special equipment must be designed and constructed. The estimated cost for this should not exceed $400.00. It is possible that additional funds would be necessary at a later date to expand these services as other hospitals joined the network.

I am personally delighted at this opportunity to work with you and to have progressed this far toward the establishment of this service. I believe that you are wise in initiating the program on a relatively small, close-to-home basis, but I can also envision a statewide network, using cooperating commercial FM outlets throughout Ohio. We would be wise, however, to avoid a too rapid expansion until "Phase A" is complete.

I am looking forward to discussing with you in the near future the final arrangements for our October, 1962, beginning of the medical broadcasts.

Sincerely,

Richard B. Hull

RBH: ge

enclosure

cc: Thompson
    Ewing
    Fuzy
    Schweikart
## ESTIMATED CHARGES FOR ONE SPRINGFIELD HOSPITAL

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On this basis, the total line charge for one Springfield hospital will be only $346.00.
June 27, 1962

Dr. Richard B. Hull
Director of Telecommunications Center
Star Road
Columbus, Ohio

Dear Dr. Hull:

I have talked to your secretary about the purchase of the necessary equipment for radio reception and telephone transmission for the Community Hospital Educational network which we will institute next fall. Mr. Boggioni has most graciously visited all of the participating hospitals and has worked out definite specifications for each station to insure the best reception with serviceable equipment of good quality.

The problem now arises as to how these items may be purchased. In view of the fact that each of the hospitals has agreed to pay for this and they realize that group purchase will effect certain economies, we have their assurance of reimbursement. The hospitals definitely committed are as follows: Springfield City Hospital, Springfield, Ohio; Mercy Hospital, Springfield, Ohio; Marion General Hospital, Marion, Ohio; Mercy Memorial Hospital, Urbana, Ohio; Fairfield Hospital, Lancaster, Ohio; Chillicothe General Hospital, Chillicothe, Ohio; Newark City Hospital, Newark, Ohio. The new Community Hospital, Marion, Ohio, and the Jane Case Hospital, Delaware, Ohio, remain indefinite. With the saving that group purchases can provide, the cost to each hospital will be between $400.00 and $450.00. In talking with your secretary it is my understanding that these could be purchased from your rotary, that a bill would be sent to each hospital which would then in turn reimburse your rotary.

The three Dayton Hospitals, Miami Valley, Good Samaritan and St. Elizabeth, already have very satisfactory FM receiving equipment but it is possible that we will need to purchase the microphone and amplifier for the telephone return. I appreciate very much the excellent cooperation that I have received from all of your people. It has been indeed a pleasure to work with them and I hope that this will be a long continued and growing association.

Yours very truly,

John A. Prior, M.D.
JAP:k
Assistant Dean
cc: Mr. Al Boggioni, Mr. Robert Schweikart
TO: Al Boggioni
FROM: Bob Schweikart
SUBJECT: WHIO-Dayton, et al
Dayton Hospitals

Dr. Prior called yesterday. He has conferred with Dr. Brown in Dayton. Brown has talked with the Vice President of WHIO and we are all set on servicing the Dayton hospitals through the facilities of WHIO. St. Elizabeth Hospital is in the fold for sure. Wright-Patterson is still a question-mark.

At WHIO, Mr. Ernie Adams, Chief Engineer, is to be our contact man. Suggest you arrange to see him on the Dayton check out trip. Perhaps I can arrange to go along.

Will discuss this further with you.

S:t

cc - Ray Giese
APPENDIX B

PROCEDURAL CORRESPONDENCE, PUBLICITY, AND MANUAL OF INSTRUCTIONS FOR MEDICAL SEMINAR PROGRAMS
MEMO TO: Bill Parks
FROM: Bob Schweikart
cc: Al Boggioni
    Ray Giese
DATE: August 21, 1962

I had a call from Dr. Prior this morning to report that WHIO-FM is happy to cooperate on the October 3 "dry run" at 12: midnight. They sign off at 11: PM. They have requested a complete checkout and complete information on setup.

When feasible, please phone Dayton, Ohio, CL-6-6871 (hang on to this number--it is an unlisted one which goes direct to the Control Room).

Contact man: Mr. Don Hapner, Chief Radio Engineer.
Dear Doctor

On behalf of the College of Medicine I want to express my most sincere thanks for your participation in the new two-way radio-telephone educational program that will begin next October 17. The programs will be broadcast over WOSU-FM and WHIO-FM Dayton on alternate Wednesdays, 12 noon to 1:00 p.m. and will go into 11 community hospitals.

To prepare for this program you will need to keep in mind that it has an important visual component in that slides will be shown at each hospital to accompany your talk. Black and white, but preferably color, slides of photos and charts may be used - we will have duplicates made and sent to each hospital.

Your subject will be _____________________________. Date ____________________.

Hour - 12 noon to 1:00 p.m. Dr. ____________________________ will speak on the same program with you. Each will talk 10 to 12 minutes. The remainder of the hour is question and answer and discussion.

By ____________________________ we will need:

1. A recent photograph of you.

2. Any slides (black and white or color) that you wish projected - suggest 8 to 12.

3. An outline of your talk - not a written summary or abstract but a subject outline of material that you intend to cover. We will mimeograph and distribute to each staff member so that they can make any notes, jot questions and keep as permanent file of our programs.
4. Each speaker should have prepared 10 questions related to his talk in event needed by moderator.

By ________________ your talk should be completed and rehearsed so that it can be tape recorded at WOSU. Since much of this program is audio, your presentation should be thoroughly rehearsed, must have clear cues for each slide and presented with dynamic enthusiasm that is contagious.

I believe that we have an exceptionally fine program prepared for our initial year and I am most grateful for your invaluable contribution to its success.

Sincerely yours,

John A. Prior, M.D.
Assistant Dean and Director
Center Postgraduate Medical Education

JAP:k
TO: All Hospitals Participating in the
POSTGRADUATE MEDICAL EDUCATION PROGRAM

RE: Additional operating Information

FROM: A. J. Boggioni, Chief Engineer, WOSU and WOSU-FM
(Phone: CYpress 3-2831), Columbus, Ohio

DATE: October 11, 1962

While our October 3 test session must, in the main, be considered successful, the very few indications of possible difficulties prompt the following suggestions on the use of your seminar equipment:

1) Set the Harmon-Kardon, DA-12 power amplifier filter switch in the "anti-feedback" position. While this impairs the fidelity to some extent, it is not serious where voice communication is concerned.

2) Before the broadcast, set the loudspeaker volume level by means of the level controls on the Harmon-Kardon power amplifier. The resulting listening level should be no higher than necessary to cover the listening area. Incidentally, the Moderator's position is the worst place from which to judge this level: a high level at that point will cause "feedback" or "ringing." In any event, keep the loudspeaker level as low as possible.

3) Set the bass cut switch on the rear of the Bogen-Presto RP-2 preamplifier in the "off" position. This will allow more accurate VU meter readings.

4) When speaking into the microphone, work at a distance of about 6-inches and make sure that voice peaks cause the VU meter to read in the red portion. (Do not cause the meter to deflect violently to its limit.) A six-inch working distance together with a fairly strong voice will tend to reduce "feedback": the resulting higher voice level causes a lower microphone control setting, thereby reducing the sensitivity to the loudspeaker output.

When "feedback" or "ringing" occurs it does no good to reduce the microphone amplifier control setting without
Typical Reminder Card
Dimensions: 4\(\frac{1}{2}\) inches by 8\(\frac{1}{2}\) inches

OHIO STATE UNIVERSITY
COLLEGE OF MEDICINE

TWO-WAY RADIO-TELEPHONE
CONFERENCE SCHEDULE

OCTOBER, 1962

WOSU-FM 89.7 mc COLUMBUS
and
WHIO-FM 99.1 mc DAYTON
12:00 NOON to 1:00 P.M.

October 17
Problems in Management of Coronary Artery Disease
JAMES V. WARREN, M.D. and
JAMES J. LEONARD, M.D.

October 31
New Developments in Diabetes and Hypoglycemic States
GEORGE HAMWI, M.D. and
ORVILLE C. GREEN, M.D.

APPROVED FOR CATEGORY 1 CREDIT
by the
AMERICAN ACADEMY OF GENERAL PRACTICE

Supported in part by an educational grant-in-aid from
THE WARREN-TEED PRODUCTS COMPANY
COLUMBUS, OHIO
To: All Persons Concerned with the Operation of the Postgraduate Medical Education Program

From: Al Boggioni, Chief Engineer, WOSU and WOSU-FM
(Phone: Cypress 3-2831), Columbus, Ohio

Date: November 9, 1962

Since we are still experiencing feedback and level difficulties, fortunately of a minor nature in almost all cases, it behooves us, at the risk of being repetitious, to make a few comments and/or suggestions.

The relative positions of your loudspeaker and microphone should be rechecked. For optimum results, their relative positions should be such that the person "on mike" would be facing the rear of the vertically mounted column loudspeaker. The bottom edge of the loudspeaker should preferably be above the microphone position. Being highly directional in the higher frequencies, which are responsible for the "crispness" of speech, a slight "tilting" or "aiming" of the loudspeaker may be desirable.

With proper loudspeaker placement, it should be possible to attain a reasonable amount of sound without feedback. Close talking and voice projection will help immeasurably towards a satisfactory result. In other words, the hospital moderator's original voice level, as the microphone sees it, must be somewhat higher than that reproduced by the loudspeaker. Talk close to the microphone--as close as four inches. Closer if necessary. At the same time, it is absolutely necessary to adjust your microphone preamplifier (Bogen RP-2) so that, on voice peaks, the meter reads in the red portion of the VU scale. If you are still experiencing feedback difficulties after these corrective measures, please let me know.

A.T. & T. incidentally, would like voice level checks a little earlier, if possible. Experience to date indicates that more time is needed to set their levels properly, and to correct line difficulties when they arise. The latter, incidentally, happened on our first broadcast but fortunately was corrected in time. We will be better able to evaluate our needs after next Wednesday's program. More on this later. Meanwhile, we would appreciate it very much if those in a position to do so would start their line checks at 11:15 a.m.
compensating by working closer to the microphone or speaking louder: the volume level going into the line is reduced and the level at the studio end must be raised. The only solution, if the aforementioned compensations are made, is to reduce the loudspeaker output level by means of the controls on the Harmon-Kardon DA-12 power amplifier.

If there are any questions concerning the operation and/or installation of your equipment, please feel free to contact me at any time.
TO: All Concerned with Two-Way Medical Education on FM

FROM: Robert B. Schweikart

SUBJECT: REHEARSAL PROGRAM

DATE: September 21, 1962

At 11:30 p.m. on the night of Wednesday, October 3, 1962, WOSU-FM (89.7 mc) and WHIO-FM (99.1 mc) will broadcast a rehearsal program on the 2-way medical education network so that all hospitals may check out equipment and procedures.

Follow the broadcast instructions and procedures prepared for your guidance. You will note that other than its being midnight instead of noon, all times will be the same.

Please follow the instructions beginning at 11:30 p.m. From that point on, we will attempt to follow the program step-by-step as indicated on pages 3, 4, and 5. Thus, this will be an accurate pattern for all of the programs which begin on October 17.

Slides will be distributed to you for this rehearsal, so that you may project them as they are indicated by the lecturers.

Ordinarily you will have collected questions written out by staff members for use during the question and answer period. In this rehearsal, you may signal and ask questions regarding procedure, equipment, and any problems you may encounter.

We request your complete cooperation in conducting this step-by-step rehearsal program so that we may serve everyone concerned to the best advantage. The late hour for this practice-run on October 3 is necessary since it is the only time at which both WOSU-FM and WHIO-FM can be free from regular programming operations.

Best wishes to you.
The predominant bass quality in some of our talks from our studios has led to several comments concerning intelligibility. We recognize this difficulty and we will try to rectify this in future broadcasts. In any event, your comments and/or critiques concerning technical aspects are most welcome.
I. Hospitals Participating

A. Off Air Pick-up from WOSU-FM (89.7 mc)

<table>
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<tr>
<th>Hospital</th>
<th>Moderator</th>
<th>Phone</th>
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<tbody>
<tr>
<td>1) Springfield City</td>
<td>Dr. John F. Harley</td>
<td>FA-3-5531</td>
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<td>Springfield, Ohio</td>
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<td>2) Mercy Hospital</td>
<td>Dr. Harold Fishbain, Mod.</td>
<td>FA-5-1521</td>
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<tr>
<td>Springfield, Ohio</td>
<td>Dr. A. T. Anton, Ass't.</td>
<td>Ext. 207</td>
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<tr>
<td>3) Marion General</td>
<td>Dr. Ivan O. Meyer</td>
<td>DU-2-1121</td>
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<tr>
<td>Marion, Ohio</td>
<td></td>
<td>Ext. 235</td>
</tr>
<tr>
<td>4) Mercy Memorial</td>
<td>Dr. Joseph F. Barker</td>
<td>653-5231</td>
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<tr>
<td>Urbana, Ohio</td>
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<tr>
<td>5) Fairfield</td>
<td>Dr. Gordon B. Snider</td>
<td>OL-3-7521</td>
</tr>
<tr>
<td>Lancaster, Ohio</td>
<td></td>
<td>Conf. Rm.</td>
</tr>
<tr>
<td>6) Chillicothe</td>
<td>Dr. Paul MacCarter</td>
<td>773-2631</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chillicothe, Ohio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) Newark City</td>
<td>Dr. J. A. Quinn</td>
<td>329-6011</td>
</tr>
<tr>
<td>Newark, Ohio</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Off Air Pick-up from WHIO-FM (99.1 mc)

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Moderator</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Wright-Patterson</td>
<td>Lt. Col. Martin Freedman</td>
<td>CL-3-7111</td>
</tr>
<tr>
<td>Dayton, Ohio</td>
<td></td>
<td>Ext. 78255</td>
</tr>
<tr>
<td>2) Miami Valley</td>
<td>Dr. Clement R. Brown</td>
<td>223-6192</td>
</tr>
<tr>
<td>Dayton, Ohio</td>
<td></td>
<td>Ext. 239</td>
</tr>
<tr>
<td>3) Good Samaritan</td>
<td>Dr. Richard Serbin</td>
<td>314</td>
</tr>
<tr>
<td>Dayton, Ohio</td>
<td></td>
<td>CR-8-2612</td>
</tr>
<tr>
<td>4) St. Elizabeth</td>
<td>Dr. Jerome Surdyk</td>
<td>222-0401</td>
</tr>
<tr>
<td>Dayton, Ohio</td>
<td></td>
<td>Ext. 241</td>
</tr>
<tr>
<td>5) Piqua Memorial</td>
<td>Dr. John T. Quirk</td>
<td>PR-3-2260</td>
</tr>
<tr>
<td>Piqua, Ohio</td>
<td></td>
<td>Ext. 71</td>
</tr>
</tbody>
</table>
Broadcast Instructions and Procedures
for
POSTGRADUATE MEDICAL EDUCATION

The Ohio State University

WOSU RADIO - Phone CY 3-2831

prepared by

Robert B. Schweikart
Manager, Program and Production
FM receiver tuned to WOSU-FM (89.7 mc) (or WHIO-FM--99.1 mc) and warmed up. (See page 2 for your station).

Speaker in proper position (meaning loudspeaker).

Amplifier ON and at proper setting.

Microphone contact with WOSU-FM established. (You may assume contact established if you have not been phoned to the contrary by us.)

Microphone OFF.

Paper and pencils distributed for questions.

Cards for AAGP credit and general registration to determine attendance and evaluate quality of program.

Speakers' outlines ready for distribution.

V. Program Format

Just before 12:00 the WOSU Announcer will give the following announcement:

"In just one moment we will proceed on separate programming. WOSU-AM will present Meridian, while WOSU-FM will broadcast a 2-way discussion in Postgraduate Medical Education. These are your stations for The Ohio State University, WOSU and WOSU-FM in Columbus, Ohio."

THIS WILL BE YOUR SIGNAL THE PROGRAM IS STARTING.

12:00:00 WOSU Announcer: "The Ohio State University Telecommunications Center now brings you a 2-way discussion of medical problems and research, between members of the faculty of The Ohio State University College of Medicine and staffs of 12 hospitals here in Central Ohio."
II. Programs

Beginning October 17, 1962, WOSU-FM (89.7 mc) will broadcast for one hour, starting at 12:00 noon, the 2-way medical programs on alternate Wednesdays, through April 10, 1962. Broadcast dates: October 17, 31; November 14, 28; December 12; January 2, 16, 30, 1963; February 13, 27; April 10.

III. Procedure

Person in charge of broadcast at each hospital will want to be at microphone no later than 11:30 a.m. on days of programs so that any difficulty may be corrected previous to 12:00 noon.

11:30 - Turn your microphone ON. Talk to yourself, chat with a colleague, read a book, anything! Just keep sound coming over your microphone for 10 minutes. (THIS IS ESSENTIAL. IT IS THE ONLY WAY WE CAN MAKE SURE YOU ARE COMING THROUGH TO WOSU. WE WILL PHONE YOU IF WE HAVE NOT HEARD YOU.)

1) While you are talking between 11:30 and 11:40, occasionally mention the name of your city and your hospital.

2) From 11:40 until five minutes before 12:00 leave your mike ON, and every now and then identify yourself, your hospital and your city.

11:55 - Turn your microphone OFF. Leave it off until you have a question during the program.

Program being aired on WOSU-FM from 11:30 - 11:45 will be the German Course; from 11:45 to 12:00, the Latin-American Beat (a music and commentary program.) Program being aired on WHIO-FM from 11:30 - 12:00 will be Enjoy Music (a good music program).

IV. 11:45 Check-off List

☑ Slides arranged in proper order.
☑ Slide projector loaded and operative; screen set up.
Here is your host and moderator for this series, Dr. John Prior, Director of The Center for Postgraduate Medical Education. Dr. Prior...

12:01:00 **OSU Moderator** makes announcements and introduces speaker(s).

12:03:00 **Lectures** on topic for day. Show slides on cue from speakers. As soon as each speaker begins, project slide photograph of speaker. Then on cue from speaker show slide 1, slide 2, etc.

Each speaker will talk 10 to 12 minutes. **Duration 20 to 23 minutes.**

12:25:00 **OSU Moderator** comments, concluding with the following: "We will open the floor for questions after we pause 10 seconds for station identification. This is The Ohio Medical Education Network."

(AT THIS POINT WOSU-FM AND WHIO-FM WILL IDENTIFY)

12:25:15 **OSU Moderator** opens floor for questions

(At any time during or after lectures you may signal you have a question as follows:)

1) Switch mike **ON** and **LEAVE ON**

2) Say: "Hello, Hello, we have a question."

3) **Await** being called on by OSU Moderator

When OSU Moderator calls on you for your question(s):

1) **State whether you have one or more questions.**
2) State **first** question slowly and clearly.

   ***Refrain from asking two or three questions together. Rather, wait until your first question is answered. **OSU Moderator** will call on you for your second, third, etc.

3) Switch mike **OFF** as soon as your **last** question is answered.

(For approximately 32 minutes--questions and answers)

12:57:00 **OSU Moderator** recaps topic and speakers, gives closing comments and announcements, then turns over mike to WOSU announcer.

12:59:00 **WOSU Announcer:** "As an educational feature, The Ohio State University Telecommunications Center, in cooperation with The Center for Postgraduate Medical Education, has just presented the _____ in a series of 2-way discussions between members of the faculty of The Ohio State University College of Medicine and the staffs of 12 hospitals here in Central Ohio. The next program in this series will be heard two weeks from today at 12:00 noon. The topic:_____________________________.
   Speakers on that date will be _______ and _______.

12:59:45 (CLOSE CUE FOR PROGRAM) "This is the Ohio Medical Education Network."

12:59:50 **WOSU Announcer:** "The preceding has been a production of The Ohio State University Telecommunications Center through the facilities of WOSU-FM
microphone input will be utilized. A volume indicator (VU meter) is mounted on the preamplifier cage so that a visual check on the output level of your transmission is readily available. An On-Off switch and pilot light also are mounted on the front panel. The output of the preamplifier is connected from the line output plug at the rear of the chassis to the telephone circuit which feeds your signal to WOSU.

2. Operation

The microphone should be mounted on its table stand and tilted upward at about a 45 degree angle or such that it points toward the Moderator's lips at a distance of about 12 inches. To turn the microphone "on," push the slide switch firmly downward as far as it will go. Leave the microphone on until your question (or questions, if more than one is to be answered during the same exchange) has been answered. Speak in a normal voice, using the same volume as you did during the initial test period at 11:30 a.m. When your participation is concluded, return the switch to the upward, or "off" position.

If no electronic technician is in attendance during the seminar, the preamplifier should also be mounted on the table in order that you can visually monitor your voice level on the VU meter as you speak. Ideally, the meter should read "zero" or slightly into the red area on the loudest voice peaks which you use in asking your questions.

Avoid handling the microphone or cable, striking the table with your hands, pencils, etc., and otherwise making noise while speaking.

IT SHOULD BE EMPHASIZED THAT THE MICROPHONE SWITCH SHOULD BE TURNED "OFF" SHORTLY AFTER YOUR QUESTION OR FIRST GROUP OF QUESTIONS HAS BEEN ANSWERED. THERE IS NO DANGER OF YOUR EXTRANEOUS COMMENTS BEING BROADCAST IF IT IS LEFT "ON," BUT YOU WILL PREVENT OUR SIGNALING CIRCUIT FROM BEING RESET, AND SHOULD YOU AGAIN WISH TO PARTICIPATE IN THE DISCUSSION AT A LATER TIME, WE HAVE NO WAY OF KNOWING THAT YOU ARE ATTEMPTING TO SIGNAL US.
1:00:00 IN THE BOOKSTALL program begins.

VI. Post-Broadcast Check-Off List

☑ Slides removed from projector.
☑ Projector and screen secured.
☑ FM receiver turned off and secured.
☑ Speaker secured.
☑ Amplifier turned off and secured.
☑ Microphone disconnected and secured.
☑ Paper and pencils gathered up.
☑ Registration cards collected — forward to Dr. John Prior, who will deliver to Ohio General Practitioners Association for credit.

VII. Additional information on your equipment and its use.

The equipment which is available to you for these seminars can be considered as performing two basic functions: first, the transmission of your voice to the broadcasting station; and, second, your reception of the entire program from WOSU-FM or WHIO-FM.

Brief descriptions of the equipment and discussions of operating techniques follow:

A. TRANSMISSION

1. Equipment and Connections

Two items of equipment are used in sending your voice to the WOSU control room; they are an Electrovoice model 664 microphone and a Bogen-Presto Model RP-2 preamplifier. The microphone is equipped with a stand, an 18-foot cable, and a sliding On-Off switch. The cable is wired for 150 ohms impedance which matches that of the preamplifier to which it is connected.

The preamplifier contains separate input channels and volume controls for microphone and phonograph. These are labeled at the rear of the chassis and on the front panel. Only the
B. RECEIVING

1. Equipment and connections

Four items of equipment are provided for the reception of the program from WOSU-FM or WHIO-FM: an antenna, a tuner, an amplifier, and a loudspeaker. The antenna connects by means of a lead-in wire to the Scott Model 314 FM tuner. The signal from this tuner is further amplified by a Harman Kardon Model DA-12 amplifier to the level needed to drive the Electrovoice column speaker.

The antenna is connected to the screw terminals marked "G" and "FM 300 ohms" on the terminal strip marked "Antenna" on the back panel of the tuner. The tuner has two identical outputs, one of which should be connected by shielded cable to either the AUX 1 or AUX 2 input receptacle at the rear of the DA-12 amplifier. This amplifier is, in turn, connected to match the 8 ohm speaker. A special socket on the amplifier should have been wired correctly for this impedance. If in doubt, consult the DA-12 amplifier manual for proper connection diagram.

2. Operation

The rotary tuning control knob permits you to tune to WOSU-FM at 89.7 mc, or to WHIO-FM at 99.1 mc. A tuning indicator shows the relative strength of the incoming signal. To tune in to a station, rotate the dial until it reads the appropriate frequency and the proper station program is heard, then tune critically by observing the black band in the center of the tuning "eye." Proper tuning is indicated by the band being at its minimum width.

A volume control is located at the back of the 314 tuner. Once its optimum operating position has been ascertained, it should be left alone and changes in volume should be made by means of the Harman Kardon amplifier control marked "Master Volume." The AUX 1 - AUX 2 control on the front panel should be set at approximately "2," either counter-clockwise or clockwise from "off" depending upon which AUX input is used. Once a volume is found which is high enough for satisfactory listening yet low enough to avoid feedback
when the microphone is on, the controls should be left alone and marked for future reference.

The filter switch on the DA-12 amplifier should be left in the "normal" position unless another is determined to be better at the rehearsal check on October 3.

The loud speaker should be located above or below the level of the microphone and to its rear, so that the participant faces both the microphone and the loud speaker.

C. FURTHER INFORMATION

Any questions relating to the technical aspects of the equipment or its operation should be addressed to Al J. Boggioni, Technical Supervisor, WOSU Radio.
April 16, 1963

Dear Doctor:

I am writing to you regarding the Two-Way Educational Conferences for this past year. Dr. Prior and I were so sorry you were unable to attend the follow-up discussion we had on April 11. The moderators and administrators who attended were most helpful to us with their criticisms and suggestions. At that time we gave them a short questionnaire on which they could indicate their feelings about the programs.

We are most interested in improving the service for next year. Therefore, we felt it was important that you have the opportunity also to indicate your reaction.

Enclosed you will find a copy of the questionnaire. Would you please fill it out and return it at your earliest possible convenience? Also enclosed is a self-addressed, stamped envelope.

Thank you for your cooperation, and I send my best wishes to you.

Very truly yours,

Robert B. Schweikart
Program Manager, WOSU Radio

RS:ML
encl. (2)

Copies sent to:

Dr. James Manchester, Chillicothe
Dr. J. A. Quinn, Newark
Dr. Gordon B. Snider, Lancaster
Dr. R. A. Welsh, Lancaster
Dr. John Harley, Springfield City
Dr. Malcolm Block, Good Samaritan
Dr. Jerome Surdyk, St. Elizabeth's
Dr. Martin Freedman (Lt. Col.)
Wright-Patterson AFB.
APPENDIX C

EXAMPLE QUESTIONNAIRES (FORMS A, B, AND C)
AND EXAMPLES OF COVER LETTER
ENCLOSED WITH EACH
7. At your hospital how often during the programs were your classes interrupted by calls, noise, people, etc.?
   - Never
   - Seldom
   - Frequently
   - Always

8. Do you feel the lecture portions of the programs were too long?
   - Never
   - Seldom
   - Frequently
   - Always

9. Do you feel the lectures were well prepared?
   - Never
   - Seldom
   - Frequently
   - Always

10. How often did the lecturers communicate their lecture material well?
    - None of the time
    - Part of the time
    - Most of the time
    - All of the time

11. Were the slides of real help to the programs?
    - Very little
    - To some extent
    - For the most part
    - Very much

12. Were the outlines of the talks detailed enough to be of reference value after the programs?
    - Never
    - Seldom
    - Frequently
    - Always

13. How often were questions submitted eagerly by physicians in attendance?
    - None of the time
    - Part of the time
    - Most of the time
    - All of the time

14. Do you feel the questions were well-answered on the programs?
    - Never
    - Seldom
    - Sometimes
    - Often
Please indicate your answers to the following questions by marking a cross (X) in the appropriate blanks:

1. On which station did you hear the Medical Seminar programs?
   ___ WOSU-FM, Columbus, Ohio
   ___ WHIO-FM, Dayton, Ohio

2. How often was radio reception of the programs satisfactory in your hospital?
   ___ Always
   ___ Frequently
   ___ Seldom
   ___ Never

3. How often did you make use of the manual of "Instructions and Procedures" for the program?
   ___ Never
   ___ Seldom
   ___ Frequently
   ___ Always

4. Compared with other teaching aids used in your hospital, how do you rate the effectiveness of the 2-way radio programs in presenting postgraduate medical courses?
   ___ Poor
   ___ Fair
   ___ Good
   ___ Excellent

5. Do the medical programs offer opportunities for learning experiences which otherwise would not be available to your fellow physicians?
   ___ Yes
   ___ No
   ___ Don't know

6. If a similar set of medical programs is offered next year, would you plan to use them again?
   ___ Yes
   ___ No
   ___ Don't know
April 26, 1963

Dear Doctor:

In planning our 2-Way Radio Telephone Educational Network for next year, we feel your candid evaluation will help to make it better. Will you please help us by completing the enclosed questionnaire? It will help us to prepare a program of greatest possible service to you.

With sincere thanks for your interest and participation.

Yours very truly,

John A. Prior, M. D.
Associate Dean

JAP/r
(Please use the other side of this sheet for answering the remaining questions and adding additional comments.)

15. What was done this past year which you feel could be done better?

16. What was not attempted this past year which you feel should be tried?

17. What other topics would you recommend be considered for future medical courses on radio?

18. What general comments would you care to make?
8. At your hospital how often during the programs were your classes interrupted by calls, noise, people, etc.?

- Never
- Seldom
- Frequently
- Always

9. Do you feel the lecture portions of the programs were too long?

- Never
- Seldom
- Frequently
- Always

10. Do you feel the lectures were well prepared?

- Seldom
- Occasionally
- Frequently
- Always

11. How often did the lecturers communicate their lecture material well?

- None of the time
- Part of the time
- Most of the time
- All of the time

12. Were the slides of real help to the programs?

- Very little
- To some extent
- For the most part
- Very much

13. Were the outlines of the talks detailed enough to be of reference value after the programs?

- Seldom
- Occasionally
- Frequently
- Always

14. How often do you feel the questions were well answered on the programs?

- Seldom
- Occasionally
- Frequently
- Regularly

15. Previous to these radio courses, how often did you consult reference materials, journals, etc.?

- Seldom
- Occasionally
- Frequently
- Regularly
MEDICAL SEMINARS
2-Way Radio-Telephone

Form B
Physicians
April 20, 1963

Please indicate your answers to the following questions by marking a cross (X) or filling in the appropriate blanks:

1. What is your area of medical practice?
   __ General
   __ Special (Indicate: ____________________________)

2. What is your hospital? ________________________________

3. Did you hear any of the 2-way radio seminars in postgraduate medicine from Ohio State University, October through April?
   __ Yes    __ No

4. How many of the 13 radio classes did you attend at your hospital? ______________________________________________
   (NOTE: IF ANSWER TO NO. 4 IS "NONE," YOU NEED NOT FILL OUT REMAINING QUESTIONS.)

5. How did you first learn about the 2-way radio programs for postgraduate medical education:
   __ From an administrator
   __ From a director of med. education
   __ From a fellow physician
   __ From hearing it on the air
   __ From publicity
   __ Other (Indicate: ____________________________)

6. How many times were you registered for AAGP credit?
   ________________________________________________

7. How often was radio reception of the programs satisfactory in your hospital?
   __ Never    __ Frequently
   __ Seldom   __ Always
April 26, 1963

Dear Doctor:

In planning our 2-Way Radio-Telephone Educational Network for the next year, we feel your candid evaluation will help to make it better. Will you please help us by completing the enclosed questionnaire? It will help us to prepare a program of greatest possible service for the practicing physician.

With sincere thanks for your interest and participation.

Yours very truly,

John A. Prior, M. D.
Associate Dean

JAP/r
16. To what extent did these radio seminars increase your consulting of reference works, journals, etc.?

- Very little
- To some extent
- To considerable extent
- Very much

17. Compared with other teaching aids used in your hospital, how do you rate the effectiveness of the 2-way radio programs in presenting postgraduate medical courses?

- Minimal
- Good
- Fair
- Excellent

18. Do the 2-way radio medical programs offer opportunities for learning which otherwise would not be available to you?

- Yes
- No
- Don't know

19. If a similar set of medical programs is offered next year, would you plan to attend?

- Yes
- No
- Don't know

(Note: If necessary, please use the other side of this sheet for answering the remaining questions.)

20. What was done this past year which you feel could be done better?

21. What was not attempted this past year which you feel should be tried?

22. What topics would you recommend be considered for future medical courses on 2-way radio?

23. What general comments would you care to make?
MEDICAL SEMINARS
2-Way Radio-Telephone

Form C
Medical Educators
April 29, 1963

(NOTE: PLEASE USE OTHER SIDE OF THIS SHEET IF YOU NEED ADDITIONAL SPACE FOR ANSWERS)

1. Would you express your feelings on the 2-way radio seminar for postgraduate medical education as a method of instruction?

2. In preparing for your program what difficulties did you encounter with your lecture; outline; use of slides?

3. Please comment on whether or not you were given sufficient radio orientation for your broadcast.

4. What are your views on the kinds of questions asked on your program?

5. How much correspondence and/or follow-up questioning came to you as a result of your program?

6. What was done this past year which you feel could be done better?

7. What was not attempted this past year which you feel should be tried?

8. What general comments would you care to make?
APPENDIX D

DATA OBTAINED FROM FORM B, QUESTIONS 1 THROUGH 4, RULED OUT OF PRESENT STUDY
TABLE 37
NUMBER OF NON-ATTENDING PHYSICIANS AND HOSPITALS REPORTED

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dayton, Miami Valley</td>
<td>17</td>
</tr>
<tr>
<td>Dayton, Good Samaritan</td>
<td>11</td>
</tr>
<tr>
<td>Springfield, Springfield Mercy</td>
<td>10</td>
</tr>
<tr>
<td>Troy, Stouder Memorial</td>
<td>7</td>
</tr>
<tr>
<td>Dayton, St. Elizabeth</td>
<td>7</td>
</tr>
<tr>
<td>Springfield, Springfield City</td>
<td>5</td>
</tr>
<tr>
<td>Springfield, Springfield Mercy</td>
<td>5</td>
</tr>
<tr>
<td>Xenia, Greene Memorial</td>
<td>4</td>
</tr>
<tr>
<td>Sidney, Wilson Memorial</td>
<td>3</td>
</tr>
<tr>
<td>Troy, Rattmer Hospital</td>
<td>3</td>
</tr>
<tr>
<td>Barnesville, Community Memorial</td>
<td>2</td>
</tr>
<tr>
<td>Bellefontaine, Mary Rutan</td>
<td>2</td>
</tr>
<tr>
<td>Chillicothe, Chillicothe General</td>
<td>1</td>
</tr>
<tr>
<td>Columbus, Grant Hospital</td>
<td>1</td>
</tr>
<tr>
<td>Columbus, Mt. Carmel</td>
<td>1</td>
</tr>
<tr>
<td>Columbus, Riverside</td>
<td>1</td>
</tr>
<tr>
<td>London, Madison County</td>
<td>1</td>
</tr>
<tr>
<td>Piqua, Piqua Memorial</td>
<td>1</td>
</tr>
<tr>
<td>Zanesville, Good Samaritan</td>
<td>1</td>
</tr>
<tr>
<td>Dartmouth, Inc.</td>
<td>1</td>
</tr>
<tr>
<td>Private Practice</td>
<td>1</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
</tr>
</tbody>
</table>

Question 3 on Form B revealed that twenty-three had heard one or more of the medical seminar programs, while the remaining fifty had not heard any; and, of course, Question 4 revealed that these pollees had not attended any programs at their hospitals, thus eliminating these questionnaires from the purposes of the present study.

The unsolicited remarks of non-attending physicians are reported here for the benefit of those who might be interested.
### TABLE 35
NUMBER OF NON-ATTENDING PHYSICIANS IN GENERAL PRACTICE OR MAJOR SPECIALTY

<table>
<thead>
<tr>
<th>Medical Area</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL.</td>
<td>32</td>
</tr>
<tr>
<td>SPECIAL:</td>
<td></td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>5</td>
</tr>
<tr>
<td>General Surgery</td>
<td>5</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>4</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>2</td>
</tr>
<tr>
<td>Obstetrics-Gynecology</td>
<td>1</td>
</tr>
<tr>
<td>Radiology</td>
<td>1</td>
</tr>
</tbody>
</table>

### TABLE 36
NUMBER OF NON-ATTENDING PHYSICIANS IN MEDICAL OR SURGICAL SUB-SPECIALTIES

<table>
<thead>
<tr>
<th>Medical Area</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURGICAL SUB-SPECIALTIES:</td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>5</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>4</td>
</tr>
<tr>
<td>Doctor, Dental Surgery</td>
<td>3</td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>2</td>
</tr>
<tr>
<td>Oral Surgery</td>
<td>1</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>1</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>1</td>
</tr>
<tr>
<td>Plastic Surgery</td>
<td>1</td>
</tr>
<tr>
<td>Urology</td>
<td>1</td>
</tr>
<tr>
<td>MEDICAL SUB-SPECIALTIES:</td>
<td></td>
</tr>
<tr>
<td>Dermatology</td>
<td>2</td>
</tr>
<tr>
<td>Aerospace Medicine</td>
<td>1</td>
</tr>
<tr>
<td>Cardiology</td>
<td>1</td>
</tr>
<tr>
<td>Industrial Medicine</td>
<td>1</td>
</tr>
<tr>
<td>Physical Medicine</td>
<td>1</td>
</tr>
</tbody>
</table>
3. I object to having to contribute through my local dues to the expensive equipment needed for this fancy and unnecessarily complicated set-up. The fixed hours are hard to work into a schedule of a practicing physician except for those who are always at the hospital. A medical journal can be picked up at any odd hour.

It is one thing to offer postgraduate courses at a fair price to physicians on a completely voluntary basis. It is quite another thing to treat physicians like a bunch of children who have to have "education" rammed down their throats and have to support these programs whether that is what they want or not. I am now paying whether I want it or not, for several AMA journals ("included" in the ever-rising fees), for the local monthly medical meetings (whether I attend or not, including a dinner), and for the equipment used in this fancy radio hook-up.

I am quite capable to choose the type of postgraduate work that I need—on a voluntary basis. (Springfield City Hospital)
Five respondents reported they did not like the time of offering with the following remarks: have evening program (Sidney, Ohio); have at 8 a.m. or 1 p.m.; not available before 1:00; could not make at time presented; always came at a busy time for me.

Suggestions on topics were as follows: more dermatology and orthopedics (simple and frequent undiagnosed complaints); sickle cells anemia; rheumatoid arthritis in children, asthma in children; anything we G.P.'s are exposed to--emphasis on diagnosis.

Additional comments of a general nature follow: longer question and answer period; lengthen program to one and one-half hours; make (programs) available to more hospitals; heard several and enjoyed very much; unable to attend--ill most of the time--plan to next year--commend your efforts.

Three atypical and negative responses are quoted below.

1. I never found out just what frequency was used, and I believe there was insufficient explanation via mail as to the program. When the announcement cards arrived, I still did not know what channel or frequency--and frequently--when. I was very interested in participating. Please send more information. (Belleville, Ohio)

2. Limited time! There are many good books. There are many good meetings, magazines, etc., including radio-TV and tapes. (Piqua Memorial Hospital)
PARTICIPATING HOSPITALS
1962-1963

Chillicothe General Hospital, Chillicothe
Fairfield General Hospital, Lancaster
Newark City Hospital, Newark
Marion General Hospital, Marion
Mercy Hospital, Springfield
Springfield City Hospital, Springfield
Mercy Memorial Hospital, Urbana
Good Samaritan Hospital, Dayton
Miami Valley Hospital, Dayton
St. Elizabeth Hospital, Dayton
Wright-Patterson AFB Hospital, Dayton
Piqua Memorial Hospital, Piqua

PARTICIPATING RADIO STATIONS
1962-1963

WOSU-FM, Columbus
WHIO-FM, Dayton

PARTICIPATING HOSPITALS
1963-1964

Akron City Hospital, Akron
Akron General Hospital, Akron
St. Thomas Hospital, Akron
Barberton Citizens Hospital, Barberton
Barnesville Community Hospital, Barnesville
Guernsey Memorial Hospital, Cambridge
Aultman Hospital, Canton
Chillicothe General Hospital, Chillicothe
Doctor's Hospital, Columbus
Coshocton Memorial Hospital, Coshocton
Huron Road Hospital, Cleveland
Marymount Hospital, Cleveland
Grandview Hospital, Dayton
Good Samaritan Hospital, Dayton
Miami Valley Hospital, Dayton
St. Elizabeth Hospital, Dayton
Wright-Patterson AFB Hospital, Dayton
Blanchard Valley Hospital, Findlay
Holzer Clinic, Gallipolis
Lawrence County General Hospital, Ironton
Lancaster-Fairfield Hospital, Lancaster
Lima Memorial Hospital, Lima
St. Rita's Hospital, Lima
APPENDIX E

LIST OF PARTICIPATING HOSPITALS AND RADIO STATIONS IN 1962-1963 AND 1963-1964
BIBLIOGRAPHY

Books


Articles and Periodicals


St. Joseph's Hospital, Lorain
Mansfield General Hospital, Mansfield
Marietta Memorial Hospital, Marietta
Marion General Hospital, Marion
Martins Ferry Hospital, Martins Ferry
Newark City Hospital, Newark
Fisher-Titus Hospital, Norwalk
Piqua Memorial Hospital, Piqua
Mercy Hospital, Portsmouth
Mercy Memorial Hospital, Urbana
Springfield City Hospital, Springfield
Mercy Hospital, Springfield
Wheeling Hospital, Wheeling, West Virginia

PARTICIPATING RADIO STATIONS
1963-1964

WOSU-FM, Columbus
WHIO-FM, Dayton
WAKR-FM, Akron
WIMA-FM, Lima
WPAY-FM, Portsmouth
WHIZ-FM, Zanesville
WERE-FM, Cleveland
WOMP-FM, Bellaire


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