R. W. CARLAW, DrPH
L. B. CALLAN, PhD

TEAM TRAINING

an experiment with promise

Inservice training and continuing education are respectable, established, and essential functions within the broad structure of public health services. The format of such training has been generally confined to one of two approaches, although other formats are emerging.

Traditionally, practitioners of the health disciplines have met at least annually at a professional meeting to present and listen to papers and to discuss problems in the implementation or consolidation of their activities. Occasionally, special courses or sessions are available so that members of a specific discipline may give their attention to a particular facet of their professional interest.

Another training format used particularly by regional offices of the American Public Health Association and elsewhere has been the interdisciplinary focus on problems. The Program of Continuing Education in Public Health in the

Dr. Carlaw, former assistant professor in public health education, University of California School of Public Health, Berkeley, is now project director, Indonesia Health Manpower Development Program, Djakarta. Dr. Callan, director of planning, evaluation, and development for the Navajo Health Authority, is former program director for administration, Institute for the Study of Mental Retardation and Related Disabilities, University of Michigan, Ann Arbor. Tearsheet requests to Dr. L. B. Callan, Navajo Health Authority, Navajo Nation, P.O. Box 643, Window Rock, Ariz. 86515.

Western States has a proud record in this area, as described in part by Parlette and Leonard (*1*).

A third format—which has had scant attention—is training of health teams from district, county, or city health department units as a group of co-workers. This paper is concerned primarily with this third approach.

The first process—the annual meeting—emphasizes problems of a discipline or professional function within the health team. Most disciplines have their professional associations. These associations have not only set norms and standards of conduct for members, but they have also provided professional recognition and visibility for innovative performance and creative thinking in public health. While these associations may have sharpened professional standards, they may also have produced greater fragmentation and created a series of columnar structures within public health which may operate against the provision of coordinated services to the client system. If the purpose of public health is the health of the public, then the egocentric nature, practices, and influences of professional associations may well be called into question.

There is considerable merit in the mixing of professional interests as modeled in the Continuing Education in Public Health programs of the American Public Health Association, Western Regional Office. This program is sponsored by the University of California at Berkeley and at Los Angeles, University of Hawaii, University of Washington, and Loma Linda University. This operational model may be expected to achieve a greater focus on the health of the public and the problems associated with defining health problems and providing solutions.

Upon closer examination, the selection of participants may be questionable. Few agencies can or will release more than one or two persons to attend continuing education courses which may run from 3 to 10 days. Even if it were possible to inspire one or two persons to change their way of thinking and behaving in such a relatively short period, an individual person cannot be expected to exert much influence on the whole department or agency after his return from the course. This assertion is supported by experiences of other training agencies. Furthermore, the method of selecting participants may be open to question in relation to their future influence within the agency (*2*).

Recently, an international educator commented on the apparent futility of selecting people for overseas training from widely scattered parts of a particular country (*3*). Occasionally, exceptionally well-placed or highly gifted people may introduce new ideas and approaches that are accepted and eventually implemented.

More often, the experience has been disappointing for all concerned. Too frequently conservative pressures of an agency or center have influenced the one or two members exposed to the re-education experience, thereby effectively neutralizing their innovative plans and enthusiasm. In practice, it seems that one man alone cannot lastingly change the attitudes or behavior of a given group.

However, when many persons from the same agency or group are exposed to similar training simultaneously, resistance to on-the-job change may be considerably reduced. Team training can open the door to increased understanding and cooperation. The underlying thesis supporting this observation is documented by social science research (*4*).

Team Training

When people learn together, they have the opportunity to explore the assumptions and stereotypes they have of each other and of the situation. This exploration can be structured or, by chance or good fortune, may be a spinoff from the process of learning together. Situation or content is in reality less important than learning together. Members of a group who already know each other well may hesitate to explore their private assumptions in the agency setting, preferring to maintain the security of their current relationship, regardless of the merits of change. This security seems to be preferred to risking the changes which a reordering of identity and relationships may provoke.

Individuals and groups have demonstrated, however, that they will risk newly learned behaviors in exploring stereotypes and will deliberately try to establish improved relationships with fellow workers when encouragement and a supportive climate exist (*5*). These factors are incorporated in well-designed training courses.

Persons who set their own standards for behaving together usually abide by those norms. When the standard norm is followed by a group of people who have a history of association and are committed to continue that association, the concept of team training assumes several significant aspects.

Specifically, team training for public health practitioners does the following:

1. Provides opportunity to examine relationships among staff and among staff and clients. It creates an opportunity to appraise assumptions and leads to identifying barriers to, and opportunities for, resolving problems. (To realize the full benefit possible from examination of staff-client relationships, it obviously is best to include clients in the training experience. However, simulation can be a meaningful compromise, particularly if the training staff assures or assumes this role function.)
2. Creates opportunity for a detailed consideration of community health problems and the behavior most appropriate to work through those problems following rigorous, trusting examination.
3. Offers reinforcement to continue on a cooperative, planned approach because peer support in the new pattern of behavior is part of the daily work experience.
4. Allows new behavioral norms to be established, and pressures from within the organization to revert to preteam training behavior are reduced when most of the staff have participated in the training experience.
5. Encourages and supports interpersonal behaviors of challenge and innovation (risk-taking).
6. Establishes a basis for dynamic input into solving the community's problems.
7. Minimizes previously compartmentalized lines of professionalism or overspecialization (*6*).

Reality Testing

We have discussed several learning constructs on theoretical and experimental bases. Now we can look more intently at specific experiences. An opportunity arose early in 1970 to test the considerations cited.

Agencies in many States, regions, and communities recognize difficulty in communication between professionals and clients. Much of the literature on health aides focuses on this problem. The consultant staff from the Georgia State Department of Public Health had observed this difficulty. They explored the problem and considered various approaches to resolve it. Through a happy coordination of enthusiasm, cooperation, innovativeness, and finance, it became possible in 1970 to arrange for training of several county health teams representative of State subunits on an "asked for" or voluntary basis.

This particular training was focused, after exploration and discussion, on problems pertaining to maternal and child health programs. The problems were common to most community health programs and were sufficiently broad to concern all members of the Georgia health teams.

Consultants in nursing, maternal and child health, and health education discussed the problems with representatives of several county health departments. Some discussants were highly receptive, and tentative plans were made to involve five interested county departments in a team training experience.

A planning committee formed early in 1970 consisted of one representative from each of the five self-selected counties and three employees of the Georgia Department of Public Health. This committee located two experienced instructors, selected a training site (the Kellogg Continuing Education Center at the University of Georgia, Athens), and determined a date suitable to all participants.

Close liaison between the committee and the instructors made thorough planning an easy joint process. Regular visits to the counties by committee members from the State health department enabled supportive exploration of ideas, clarification of problems, and more than usual personal involvement in planning. County team members were selected to be widely representative of their discipline and as influential as feasible within their department and discipline.

Once selected, team members met to consider and designate areas of greatest interest to them. These subject areas were ranked according to importance, and lists from the five counties were submitted to the instructors for organization into a cohesive training plan. An initial outline developed by the instructors was referred back to participants through the planning committee, minor modifications were made, and the following schedule was adopted for a 3-day program in June 1970.

Topic	*Hours*
Introduction to seminar	½
Models of planning	1
Behavioral elements in planning	¾
Communication exercise	¾
	3
Communication theory session	1
Problem definition	1
Organization-managerial styles	1½
	3½

Exercise in managerial styles	3
Theory session on PERT	1
Small group work PERT procedure	3
Theory session on PERT	¾
Small group work	3
	10¾
Sharing of initial PERT planning by teams	3
Critique-review closure	1
	4

Preseminar reading was selected by the instructors and planning committee. Team members were asked to read as much of this material as time and interest allowed before the seminar, and more specifically, after the team training experience.

The major goal of the training was to promote widest use of skills in multidisciplinary approaches to the resolution of public health problems by careful definition, planning, and program implementation. Secondary goals included (*a*) exploration and testing a variety of problem diagnostic modalities to delineate more adequately problem dimensions and (b) applying a variety of learning situation tools to public health educational programs in order to achieve more effective resolution of public health problems.

A major part of the pretraining course preparation was that team members meet and identify particular health problems or projects on which they might work as a county team. Some effort at delineation of the problems was essential prior to the training experience. This activity served to provide a common frame of reference for all members of the team.

Perhaps the most disappointing aspect of this preparatory phase was that only two physicians participated with the county health teams. Whether this situation reflects a distance between the health officers and the rest of the team, as suggested by Scudder (*7*), or whether it is merely a comment on the health officer's view of his need for further education is academic. The health officer is an important member of the health team, and the entire learning process would have been strengthened by the presence and involvement of a greater number of health officers. The participation of the two attending health officers was highly valued and enhanced the learning experience of all members.

The Training Process

The county teams remained together throughout the 3 days of the initial training course. They worked closely with the instructors. Emphasis was on existing situations in their home counties, and members had frequent opportunities to discuss their problems and successes with the other county team members. The initial task was diagnosis and delineation of a specific problem, followed by identification of resources and determination of degrees of potential community involvement. A program plan was organized in detail by each county team, goals and objectives were set, and target dates and use of resources were identified. These plans were shared with other county teams and modified as necessary for shared reactions. Keynotes in this process were reality and feasibility.

The primary planning model used was program evaluation and review techniques (PERT) (*8*), familiar to many administrators. Final plans represented real and personal commitment by the county teams. They included measurable objectives, target dates for accomplishing activities, and ongoing evaluation permitting program modification. Each county plan was based on a problem confronting the health team from that county and was the result of rational, noncrisis deliberations. Each plan was to be put into operation as soon as the team returned home.

Within the structure offered by the development of such a program plan, the teams experienced several laboratory sessions on leadership styles and communication modalities. These sessions probably provided more informal and out-of-hours comment than the planning input sessions. The highly personal focus of the communications laboratories encouraged much of the interpersonal adjustment that was accomplished.

Teams varied in their responses to these interpersonal challenges. Some members provided situational leadership in risk taking and innovative thinking. One team in particular had difficulties in handling personal interaction and, as a result, was unable to complete its county program plan. This was an unfortunate experience for those members, but it emphasized the importance of the human element in the planning process. Almost all other members of the training group reported their interpersonal experiences demanding, but rewarding, both personally and professionally. These experiences produced a new appreciation for the potential overlap of designated functions and of possibilities for mutual assistance across disciplines in meeting the interests of the client or the client system.

It is important to note that the group that experienced the greatest difficulties was the only fully heterogeneous group present. Its members were from several county agencies, that is, mental health, public health, and social welfare. This group's county was operating on more of a district level organizational pattern than that of the other participating teams. All the other groups in this session were from various county health departments. In retrospect, perhaps this heterogeneous group should not have been invited to participate in a team-focused seminar because it apparently differed so much from the other groups. On the other hand, had this group's members or the instructors perceived and understood this difference, they might have gained from observing other group action models.

Evaluation

Immediate post training evaluation measures little but the emotional level at the conclusion of a course. This may or may not be pertinent to a changed function on the job. The instructors therefore counseled that evaluation of the course be delayed for 8 weeks so that each team would have an opportunity to put into effect plans they had designed during the seminar.

The evaluation procedure was prepared by the instructors to measure achievement of the objectives set for the team's training experience. The procedure was accepted by the planning committee prior to the seminar. The evaluation form, which was to be completed by each member of the course, was a series of open-ended questions interspersed with statements to elicit attitudes on which Likert-type scale rankings could be made. Responses were generally positive, and the following summary of this evaluation was provided to participants.

June 1970 Workshop Evaluation

(data collected after September 1970)

Major Goal

The major goal of the workshop was to promote a wider utilization of personal and professional skills within a multidisciplinary approach to public health problem definition and program implementation, through the techniques and methodologies of a problem-focused approach in a workshop setting.

1	1	1	3	8	4
Was not met					Was met completely

COMMENTS:

"A good approach—will be helpful to have a follow-up workshop to explore theme further—and include other disciplines."

"The value of conciseness was impressed upon me, especially in giving instructions to multi-team members. I had not fully realized how large a part emotionality plays in problem solving."

"This goal was met at the workshop and has been carried over to health department activities by means of the project which is being worked on now. I hope that this particular method of utilizing the multidiscipline approach to problem definition and program implementation and utilization of the problem solving process can become a conscious, routine part of program planning for this department."

Secondary Goals

Secondary goals were:

(*a*) To provide an opportunity to explore the application of theory to practical problems in order to update planning and action skills utilizing research findings.

1	1	1	1	7	7
Was not met					Was met completely

COMMENTS:

"The value of communication within the staff and with the public was emphasized again and again. We do not communicate effectively much of the time."

"I felt that we explored the use of theory in solving practical problems. But, this is only an exercise unless we use research back in our local agencies. I feel that we are using research to update planning skills."

"The trainers were excellent in presenting the theories and models on problem solving. The opportunity to apply them to our own problems was amply supplied."

(*b*) To use a variety of diagnostic models in order to delineate and define problems more adequately, plan approaches for implementation, and select appropriate evaluation techniques which will provide observable measures of program success.

0	0	5	2	7	4
Was not met					Was met completely

COMMENTS:

"The techniques used to reach this objective were highly effective—the group was 'forced' into thinking and working together."

"I felt that we covered evaluation techniques well and we came a long way in defining problems; but, we hardly touched on implementation techniques."

"This goal was effectively met and work done on writing objectives with evaluation techniques was especially helpful."

(*c*) To experience a variety of educational tools applicable to public health educational programs in order to broaden current skills and to extend resolution of existing public health problems.

1	1	2	2	7	3
Was not met					Was met completely

COMMENTS:

"It was helpful to be reminded that evaluation should always be educational—not punitive."

"Demonstrations proved these things can be used. This was good."

"I was particularly interested in PERT and believe it will be of great assistance to systematic approaches to problem solving now and in the future."

Additional questions:

A workshop involving interdisciplinary teams is a new approach to training in Georgia. Do you think that this is useful?

15	2	1	0	0	0
Very useful					Not useful at all

COMMENTS:

"Very necessary if we are to have any interdiscipline function at all."

Followup Intervention

In the work setting, as the programs which had been developed at the initial training session unfolded, needs of team members became sharpened and clarified. The experience of planning together was subjective, and, although in each instance the plan was directed to the delivery of technical services, its implementation demanded interpersonal skills and sensitivity beyond that of most team members. Coordination and cooperation across vertical and horizontal lines of the organization created expectations and tensions which had not been apparent in the democratic setting of the training.

In evaluating their progress, team members expressed their need for more understanding of the human relations aspects of teamwork. Although program plans were reported as progressing favorably and teams were functioning as units, members identified a clear need for improving interpersonal skills.

In response to the demand for more understanding of interpersonal skills, the planning committee, in the followup contact of members of the county teams, explored this interest as a desirable focus for a subsequent workshop. The response was highly enthusiastic from four of the teams. The county group which had experienced difficulty in the initial course opted not to attend. Perhaps better followup consultation and action taken in the first seminar may have prevented this.

The planning committee arranged for the training staff who had led the June 1970 team program to organize and lead such a course planned for March 1971. It was decided to limit participation in this second workshop to the four county teams who had attended the earlier course, but to increase the number of team members from seven to nine, with emphasis on inclusion of health officers and health aides.

The outline for the second course was developed by the instructors from the comments provided in the evaluation summaries and reports of behavioral science research. The outline was submitted to participants through the planning committee and modified to meet needs of the teams. A full session with the planning group and instructors just prior to the workshop allowed for inclusion of further ideas and emphasis of the training committee's findings, as shown in the following schedule of the course conducted in March 1971.

Topic	*Hours*
Report out on planning progress	2
Identifying successes and barriers	1
	3
Theory session on Johari Window	½
Johari exercise	½
Discussion	½
How to give and receive help	2
	3½
Communications laboratory	3
Role play simulated staff conference	1
Discussion	1
Maslow's hierarchy of needs exercise	½
Theory session on motivation	½
Discussion	1
	7

Pictorial planning of small groups' exhibit	2
Explanation of exhibits and plans	¾
Critique session	1¼
Review-closure	½
	4½

The format of the workshop varied from the earlier course. County teams reported on their success or failure in reaching the targets they had set 9 months earlier. Reasons cited for not achieving objectives predominantly related to timing and resources available and, more important, to factors of human interaction and the identification of frustrations associated with such interaction. Problems and frustrations were identified, listed, and shared among the teams.

Participants then elected to form task forces to consider possible solutions to their frustrations, including obstructionism of team members. These self-appointed groups did not organize geographically or as teams, but on the basis of their respective professional disciplines. Reports from these task forces were most frank and helpful.

Self-selection for such task forces was encouraged because of the initial and preseminar differences and lack of trust between county practitioner and State consultant. Such grouping enabled higher risk taking among participants in the protective "laboratory" environment. Instruments such as the "Personal Relations Survey" and the "Work Motivation Inventory" were used to sharpen interpersonal awareness and to assist the task forces in their comments on solutions to human problems they experienced (*9, 10*).

Methodology

Methodological emphasis was on working in dyads and triads on consultation for teams and individuals. Most of the training situations were based on reality situations; role playing was used effectively at appropriate times.

The concept of health department staff as human resources (*11*)—each having a unique contribution to a problem situation—was compared with an older human relations model (*12*) —which is current practice on many health department teams. It was noted that some counties still operate on a scalar or semimilitaristic operational model whereby all planning is done by the health officer. The principle of participatory involvement as stated by Allport (*13*), Lippitt and associates (*14*), and Griffiths (*15*) served as the foundation philosophy for team involvement in initiating, executing, and evaluating health plans.

This second training experience was more dynamic and personally involving than the first. Members had discovered in the interim since the first session that their plans made sense, that each team member had ability, and more important, that they had the freedom to implement their plans. The public health team was working on community problems as a team rather than as a series of marginally related disciplines.

A high level of human interaction was experienced in these sessions. As a result, much interprofessional defensiveness was identified, and steps were taken to resolve these impeding forces. Personal defensiveness in the workshop, most highly visible at times, was seen as healthy. Interpersonal difficulty was recognized and dealt with openly in dyadic or triadic confrontation with supportive intervention from instructors.

As in the initial course, it was considered advisable to wait several weeks before attempting evaluation. A similar format of open-ended responses to questions and situations was employed. The responses to questions that we consider essential in evaluating a training program are discussed in the following section. Some negative comments in the evaluation were related to the lack of opportunity or ability to share new viewpoints with other members of the county health team who were not able to participate in the first training program. This was an area to which both planning committee and trainers might have given more attention in designing training for county health teams.

Participants' Responses

Personal responses to the first team training program were highly positive. The question on how completely objectives had been met was rated in the top two sections of a 9-point scale by 75 percent of participants. Major advantages recognized were (*a*) greater involvement and conciseness in planning and (*b*) enabling county team members to think and work together. Disadvantages related to lack of time available and the lack of representation of all disciplines.

A major point was the recognition that the achievement of a positive climate for communication was too often cited as a point of failure in public health program endeavors. "What are we really saying?" and "What do they hear us

say?" These are questions we should ask more often and agree on the answers.

In the second workshop, responses were more complex and more detailed. Responses to questions not covered in the ensuing narrative are listed in the following table.

Since your return from the March workshop, how does your group function as a team?

Poorly	[1]1	2	3	4	5	6	7	Excellently
	[2](1)	(3)	(2)	(2)	(2)	(3)		

Please give your estimate of change in the delivery of health care services:

Delivery since team training was initiated

Much better	5	4	3	2	1	0	1	0	1	2	3	4	5	Much poorer
	(1)	(3)	(4)	(2)	(4)	(2)								

What effects, if any, are you aware of in your level of satisfaction in your job since more emphasis has been placed on teamwork?

Job less satisfying	(3)	(2)	(1)	(0)	(1)	(2)	(3)	Job more satisfying

In your opinion, did the March workshop affect the *level of operation of your county team?*

Level of operation improved	3	2	1	0	1	2	3	Level of operation declined

Has there been real change in your duties since training in county teams was initiated? Please indicate extent of change, if any:

No change	0	1	2	3	4	5	Much change
	(4)	(1)					

[1] These numbers indicate, in each set for each question, the ranking responses possible.

[2] Numbers in parentheses indicate the number of actual responses to each question by participants.

Nine areas of training were ranked for their impact on health behavior. The following ratings were given by participants.

Team function	*Comparison index* [1]
1. Problem diagnosis	38
2. Work motivation	34
3. Interpersonal relationships	33
4. Innovative thinking	31
5. Self-analysis	28
6. Supervisions and consultation	28
7. Leadership study	28
8. Evaluation	26
9. Program planning	24

[1] The rankings were recorded on a 5-point scale. Five rated high. Response totals for each ranking point were multiplied by the numerical value of that point, and these subtotals added to give a comparison index for the overall ranking.

In referring to their professional growth, most people cited teamwork exercises and group problem solving, whereas the self-analysis exercises were most important for personal growth: "Perhaps I don't really listen to what people say." "I became aware of how easily frustration emerges when professionals (including myself) are not attentive."

When asked if the county group functions as a team, the participants' responses varied. Most respondents reported the need for more interchange and attention to planning. Participants rated post training change in the delivery of health services positively. They have reported more planned preprogram introduction or orientation, more consultation, and increased emphasis on education. There was no reported change in duties, but respondents felt more responsible for a total team approach and more effective in their jobs as a result of the training experience.

For future courses, respondents suggested more emphasis on (*a*) team conferences and interdisciplinary sharing, (*b*) leader function in the team, and (*c*) how to relate to the public as human beings rather than impersonally as "patients." Participants thought it essential that future workshops include more health officers, nursing directors, and agency decision makers who can set and maintain the milieu for implementing the teams' plans on return to their regular assignments.

The consensus was that "the team approach is much more profitable than individual staff training," and that "this is the only meaningful approach for high productivity of care accomplishment."

Perhaps the greatest lack of evaluation is that of objective field measurement from the instructors' perspective. Ideally, a previously uninvolved party should have evaluated the county teams—both participants and controls—before and after team training. A similar evaluation using the same measures performed 2 years later would reflect a more valid and reliable indication of change in team or in interprofessional collaboration. Care would be needed in such evaluation to avoid the "Hawthorn Halo effect" (*11*). In the absence of such objective measures, the best indicator would be a post hoc field study or, as has been done, an assessment by the participants of the changes in the agency and the personally expressed value of such team training.

Conclusion

Inservice training courses usually have been constructed by discipline or by selection of one or two professionals who can be spared from different agencies at certain times. These procedures provide a narrow base for changes by the agencies or impact on their programs.

By arranging for county health department teams of from seven to nine members to undertake two short training courses, it was hoped to provide a base for interdisciplinary program planning and interprofessional sharing. The objective was to achieve greater efficiency in providing improved services and the increased acceptance of the population served.

Numerous personal changes are evident among the trainees. At this time, however, there is no evidence of gross change in the service patterns of any agency or interpersonal or intrapersonnel behavior, or both. This lack of change may reflect, in part, the noninvolvement of major decision makers in the team training process. We make this observation to emphasize the interrelatedness of a given system, not to detract from the evidence of change cited earlier.

One cannot ignore the wholeness of a system and fail to plan for the effects that change will have on other parts. For example, an infection of the respiratory system treated with an appropriate medication can result in overall relief to the person. Inappropriate medication could cause unwanted side effects to other parts of the body or the entire system.

Similarly in organizations, change will proceed more smoothly where planned steps are set and met, important linkage continuity is maintained, and complete information is fully shared among all involved. Consequently, the opportunity to learn new thinking required to perform new procedures can be experienced in a supportive climate.

Our experience demonstrates that the teams have initiated several important steps in the change process. Managerial teams from district level health agencies in Georgia have expressed interest in similar training intervention for themselves, and this interest may be seen as another index of forward movement.

A similarly planned and operating model is underway in Michigan. The initial target populations there include the three key decision makers of all of the residential and regional community-based State mental retardation facilities; middle management personnel of these organizations form a second cohort.

We expect to continue reporting on team training in public health to emphasize its importance and to add to an accumulating empirical knowledge base. Team training is essential to avoid waste of manpower and to promote the organization of a more efficient and effective system of protecting and caring for community health.

REFERENCES

(*1*) Parlette, G. N., and Leonard, A. R.: Continuing education in public health. The experience of the western States, 1959–1966. Am J Public Health 58: 558–568, March 1968.

(*2*) Carlaw, R. W., and Parlette, G. N.: Northern and southern health directors differ on continuing education. Calif Health 27: 9, 12, October 1969.

(*3*) Mathews, B.: Planned change and the web of training. Pacific Health Education Reports, School of Public Health, University of California, Berkeley, 1971, vol. 2, pp. 1–15.

(4) Mann, F. C., and Neff, F. W.: Managing major change in organizations. Foundation for Research on Human Behavior, Ann Arbor, Mich., 1969.

(*5*) Coch, L., and French, J. R., Jr.: Overcoming resistance to change. *In* Group dynamics: Research and theory, edited by D. Cartwright and A. Zander. Row Peterson and Co., Evanston, Ill., 1953.

(*6*) Hoff, W.: Resolving the health manpower crisis: A systems approach to utilizing personnel. Am J Public Health 61: 2491–2504, December 1971.

(*7*) Scudder, H.: National problems in health manpower. *In* Proceedings of the Conference on Health Sciences at the Baccalaureate and Beginning Graduate Level. California State College at Hayward, 1968.

(*8*) Arnold, M., editor: Health program implementation through PERT: Administrative and educational uses. Western Regional Office, American Public Health Association, San Francisco, 1966, pp. 1–90.

(*9*) Hall, J., and Williams, M. S.: Personnel relations survey. Teleometrics International, Conroe, Tex., 1967.

(*10*) Hall, J., and Williams, M. S.: Work motivation inventory. Teleometrics International, Conroe, Tex., 1967.

(*11*) Miles, R. E.: Human relations or human resources. Harvard Bus Rev 43: 148–163 (1965).

(*12*) Roethlisberger, F. J., and Dickson, W. J.: Management and the worker. Harvard University Press, Cambridge, Mass., 1947.

(*13*) Allport, G.: The psychology of participation. Psychol Rev 53: 117–132 (1945).

(*14*) Lippitt, R., Watson, J., and Westley, B.: The dynamics of planned change. Harcourt, Brace and Company, New York, 1958.

(*15*) Griffiths, W.: The principle of participation. Health Educ J (London) 17: 222–229, November 1959.