5. A task includes all of the elements needed to produce an output which can be independently used or acted upon without special explanations to the next performer in the next stage of production.

6. A task includes all the elements needed to complete an output to a point at which another performer (who would continue with the next production sequence) would not have to redo any elements in order to continue.

7. A task includes all the elements needed to complete an output to a point at which another performer, in order to continue with the next stage of production, need not perform extra steps.

8. The task must not require that, for another performer to continue with the next stage in a production sequence, current institutional arrangements would have to be changed.

9. A task must be sufficiently broad in statement that it can be rated on its frequency of occurrence.

10. Two tasks are the same if their elements result in the same output, require the same things to be used (including the alternatives to be chosen among in what is used), and if the kind of recipient, respondent or co-worker involved is the same in terms of what the performer needs to know in order to deal with the person.

The HSMS task definition permits the acknowledgment that much professional level training is used primarily for the emergency or contingency situation, but must nevertheless be accounted for in the task's identification. For example, the task of delivering a baby through the vagina (normal delivery) must contain elements including the decision that complications warrant a change of procedure (such as to Caesarian section),the choice of anesthetic, and the possibility of responding to cardiac arrest -- if the performer of the "normal" delivery is the one who must deal with these contingencies.

existing procedures and activities. Thus, a new task or set of tasks can be assigned to the job title containing tasks most similar in the skills and knowledges required. The new tasks can be placed within existing task groupings. Workers' mobility across industries can similarly be facilitated by dealing with tasks across industries. Though it is not now imminent, the method could conceivably be used to facilitate employee readjustments due to the employment dislocations which could accompany disarmament.

Data Banks and Prototype Ladders

Since the HSMS methodology is generically oriented, it results in data which can be used beyond the walls of the institution in which the data are collected. The task data provide three levels of detail, and, therefore, can be abstracted as needed for the construction of prototypes. Alternatively, a set of data can be inspected by an institution and it can modify these to reflect its own conditions. Thus, as the method is used and a data bank becomes available, the applicability of the data grows geometrically; any number of combinations of data can be used to develop job ladders. The investment in time and effort to collect the data can be spread as time passes and only new task data are added.

Even simpler than modifying the task data would be the modification of reported job ladder designs to suit a given institution's needs. Thus, if an organization such as the Health Services Mobility Study can generate generalizable and basic job ladders, such prototypes have potentially limitless application.

CHAPTER 5

A GUIDE TO HSMS DOCUMENTS

This chapter reviews the full output of documents produced by the Health Services Mobility Study during Phases I, II, and III and notes their availabilities.

TECHNICAL REPORTS

Since the inception of the Project, ten Technical Reports have been produced. This report is itself the eleventh. The Technical Reports are progress reports which review the work of the Project over specific periods. They covered progress and events in research and technical support, future plans, and other organizational matters. The reports carried the statistical results of individual field tests and kept the reader informed of problems and solutions. In addition, policy statements and related material were sometimes included.

The pertinent research and statistical content in these reports is now contained in Research Report No. 3 in its three Volume III's. The two appendixes presented in this document contain most of the material not covered in Research Reports 3, 4, 5, 6 or this report. This document essentially replaces the ten prior Technical Reports, and none of the ten are now available for distribution.

WORKING PAPERS

The Project produced ten Working Papers. Except for Working Paper No. 10 (discussed later in this chapter) all are now obsolete and

should not be retained by any readers who have received them. None are now available for distribution. Working Papers 1 through 7 were the field manuals covering a series of field tests of specific aspects of the methodology. All the tests resulted in revisions of definitions, scales, and procedures, so that none include current material.

Working Paper No. 8 was the field test manual used in the preliminary work done on finding General Intellectual Skills. It is not likely that this document will be of interest to the general reader. The results are described in Research Report No. 3, Part B, Volume III.

Working Paper No. 9 was never used in the field. The Knowledge Classification System and Knowledge Scale were subjected to dry runs before a full field test. Sufficient revisions were required to make Working Paper No. 9 obsolete before it was used. The pilot test at the Dr. Martin Luther King, Jr. Center was the first field test for the Knowledge System.

RESEARCH REPORTS AND WORKING PAPER NO. 10

The documents described in this section represent final research results with respect to the objectives of Phases I, II, and III. However, several of the reports will be subjected to further revision during the Demonstration Phase of the Health Services Mobility Study. Such reports will be indicated as having "limited distribution." This means that HSMS reserves the right to decide on the appropriateness of requests for the documents. There is no authorization for use by third parties. Other documents may be obtained by writing to the appropriate publisher or can

be made available to primary users by contacting the Health Services Mobility Study.

Research Report No. 1

The first HSMS Research Report was Train Practical Nurses to Become Registered Nurses: A Survey of the PN Point of View.[1] The report discusses the responses of 2,361 licensed practical nurses (LPN's) working in New York City municipal hospitals. The questions posed covered their interests and needs with regard to training to become registered nurses (RN's).

In addition to providing a breakdown of responses by demographic characteristics, the document provided additional information. The document reports that there is marked employee interest in upgrading training and a willingness to contribute time and effort for such training among LPN's. The Report discusses how educational institutions can cooperate to shorten training time through exemptions, transfer of credit, use of equivalency testing and redesign of curricula. It indicates how a coordinated cycle of training for several steps in a job ladder designed to fill upper-level vacancies can minimize costs. It proposes several alternative educational sequences and alternative means to fund released-time training and tuition costs, including the design and strategy for a nursing sequence from nurse aide to staff nurse with an exit point at practical nurse, and another sequence from practical nurse to staff nurse.

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[1] The author is Eleanor Gilpatrick.

This document appeared in June, 1968,and was accepted for publication by the Hospital Research and Educational Trust (Chicago) in September, 1969. The publishers assure us that they have been beset by technical delays and that publication is now expected by the summer of 1972. The document must be obtained through the publisher, unfortunately, since other copies have long since been distributed. The ERIC system may be contacted for an early, unrevised photocopy.

Research Report No. 2

Research Report No. 2 was published by Praeger Publishers in 1970.[2] The document examines the organizational context within which New York City Municipal hospitals are staffed, and describes factors affecting employment such as wages, vacancies, credentialing and mobility within the system. The Report concludes that the bars to upward mobility are not due to entry-level shortages, and that the major impediments to upward mobility are a lack of organizational commitment to job ladders, credential barriers, redundancy of educational programs, and the fact that middle and upper-level jobs require a good deal of investment in academically-based education. The Report offers suggestions on mobility, job pathways and training. It calls for the development of a strong manpower function and a commitment to a job ladder approach to filling vacancies, and offers some models. It further shows how a job ladder approach can serve the

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[2] Eleanor G. Gilpatrick and Paul K. Corliss, The Occupational Structure of New York City Municipal Hospitals, New York: Praeger Publishers, 1970.

needs of management by filling vacancies, and can serve the needs of the employees by providing upward mobility.

The document may be obtained from the publishers.

Research Report No. 3

Research Report No. 3 is entitled A Job Analysis Method For Developing Job Ladders and For Manpower Planning. This document is divided into three Parts and nine Volumes. Together, the volumes comprise the job analysis methodology of the Health Services Mobility System.

The Part A documents deal with task analysis; Part B covers the skills; and Part C covers the Knowledge System and the computer work. Each Part has three volumes including a method manual, a job analyst training manual,and the literature review and statistical results of testing for the respective Part. All nine volumes are on "limited distribution." The documents are described below.

Research Report No. 3. Part A: Task Identification.
Volume I: A Manual for Task Identification.
By Eleanor Gilpatrick.

This manual serves both as an introduction to the overall HSMS approach and methodology and as a working manual for task identification. Chapter 1 is an introduction to the HSMS approach to manpower development and to task identification in particular. Chapter 2 explains how the manual is used. Chapter 3 outlines the scheduling and planning necessary to arrange for orderly data collection. It serves as a model for Parts B and C, as well. Chapter 4 presents the definitions and rules used

in the task identification procedure and elaborates on specific aspects of these. Chapter 5 presents a step-by-step list of the events related to data collection for task identification. Chapter 6 directs the data processors in preparation and analysis of reliability and accuracy measures, and Chapter 7 directs the data processors in the conversion of the analysts' field data into "hard data," or "Master Tasks," as they are called. The identification of overlap tasks (tasks appearing in more than one performer's job), is also discussed in the chapter. Chapter 8 indicates ways in which the task data can be used for analytic purposes before skill scaling and knowledge identification is done.

Research Report No. 3. Part B: Skill Dimensions of Tasks.
Volume I: A Manual for Scaling Tasks on Skills.
By Eleanor Gilpatrick and Earl E. Davis.

This is the working manual for skill scaling. Chapter 1 presents the general concepts to be used in skill scaling. Chapter 2 presents the sixteen skill scales and the Task Frequency scale with a brief discussion of each. Chapter 3 presents a step-by-step list of the events related to data collection for skill scaling. Chapter 4 directs the data processors in preparation and analysis of data to measure the reliability and accuracy of the analysts' scaling. Chapter 5 directs the data processors in the conversion of the analysts' field data into "hard data" for scale values for the "Master Tasks."

Research Report No. 3. Part C: Knowledge Identification and Scaling of Tasks. Volume I: A Manual For Knowledge Identification and Scaling. By Eleanor Gilpatrick and Philip von Esch.

This volume is a working manual for identifying the knowledge needed to perform job tasks and for scaling the knowledge categories identified for each task. Chapter 1 presents the general concepts which underlie the Knowledge Classification System and the Knowledge Scale. It also includes a brief history of the Knowledge Classification System and some guidelines for the user. Chapter 2 presents a detailed description of the Knowledge Classification System. It covers the definitions, the organizing principles, the arrangement of the System, and rules for its use. Chapter 3 is the Knowledge Classification System itself, followed by an Index and Glossary. Chapter 4 presents a step-by-step list of the events related to data collection for knowledge identification. Chapter 5 directs the data processors in the preparation and analysis of data to measure the reliability and accuracy of knowledge identification. Chapter 6 is a step-by-step list of the events related to data collection for knowledge scaling. Chapter 7 directs the data processors in preparation and analysis of data to measure the reliability and accuracy of knowledge scaling. Chapter 8 directs the data processors in the conversion of the analysts' field data into "hard data" knowledge identifications and scale values for the "Master Tasks." It describes the use of the Knowledge Classification System as a filing device and also discusses the use of Knowledge System data.

Research Report No. 3. Part A: Task Identification.
Volume II: Training Job Analysts in Task Identification.
By Irene Seifer and Eleanor Gilpatrick.

This volume is the first of a series of three training manuals each of which concentrates on a phase of the job analysis methodology developed by the Health Services Mobility Study (HSMS). The contents of this document deal with task identification and are designed for use with Part A, Volume I of the Report: "A Manual For Task Identification." In addition, this volume presents material which is applicable in all of the stages of task analysis. The two other training manuals deal with the specific additional work covered by a particular stage of the method involved. Taken together, the three training manuals constitute a training program for job analysts in the use of the HSMS task analysis methodology.

Chapter 1 serves as an overall introduction to the manual and advises the reader on how to use it as a workbook. It includes a code of behavior for the analyst. Chapters 2 through 7 are in lesson form, with review questions and answers provided for each. Chapter 2 provides a brief overall introduction to the concepts and definitions used in the HSMS task analysis method. Chapters 3, 4 and 5 are focused on details of the definitions and rules used in task identification. Chapter 6 concentrates on how the rules and definitions are to be reflected in writing up the data collected. Chapter 7 covers similar material, but this time in terms of the procedures to be used. Chapter 8 is a guide to observation and interview techniques. It deals with the relationship of

the analyst to the persons involved in the task analysis. This chapter is applicable to all of the training manuals.

Research Report No. 3. Part B: Skill Dimensions of Tasks. Volume II: Training Job Analysts in Skill Scaling. By Irene Seifer and Eleanor Gilpatrick.[3]

This volume is a training manual for rating tasks (which have already been identified) on the HSMS skill scales. Chapter 1 of this manual serves as a brief introduction to the training and explains how the manual is to be used as a workbook. Chapter 2 provides an introduction to the general concepts used in skill scaling. It briefly discusses skill scaling procedures, describes how task identifications are reviewed for correctness and completeness, and how tasks can be written up so as to facilitate skill scaling. Chapters 3 and 4 present the latest versions of the seventeen HSMS scales and explanations of how each is applied. Revisions of some of the scales, which were made as a result of the pilot test, are incorporated. Thus, the Part B, Volume II versions of the scales take precedence over those in Part B, Volume I. This manual uses examples of tasks identified in the field as an aid to training.

Research Report No. 3. Part C: Knowledge Identification and Scaling of Tasks. Volume II: Training Job Analysts in Knowledge Identification and Scaling. By Irene Seifer and Eleanor Gilpatrick.[4]

This volume is a training manual for use of the HSMS method of identifying the knowledge categories that are required to perform tasks

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[3] Part B, Volume II and Part C, Volume II are currently bound together in a two-part document.

[4] Ibid.

and for rating the levels at which the categories are required. This phase of the HSMS method is applied to tasks which have already been identified and rated on the skill scales. The manual offers elaboration, explanation, and clarification of the definitions and concepts of the Knowledge System as well as minor revisions. The manual presents discussions about the problems which can arise in the use of the method and ways to handle them. It also offers practice examples and exercises.

Chapter 1 of this manual serves as a brief introduction to the training and explains how the manual is to be used as a working companion to Part C, Volume I, the method manual. Chapter 2 provides a review of the general concepts used in knowledge identification and scaling. It briefly discusses the nature of the Knowledge Classification System and the Knowledge Scale.

Chapter 3 presents a set of clarifications and revisions of knowledge category names and meanings which were arrived at during the course of the pilot test; it then provides a practice exercise. Chapter 4 deals with the practical problems which arose during the use of the System in the pilot test and offers solutions as well as a discussion of the types of errors that can be made and ways to avoid them. This chapter uses examples of tasks identified in the field as an aid to training. In addition, an annotated bibliography on role-playing is included. It can be used as a means of gaining more information about techniques which can help develop the kinds of skills and insights required to properly apply the HSMS methodology.

Research Report No. 3. Part A: Task Identification.
Volume III: Data on Task Identification.[5]

The three Volume III's of Research Report No. 3 deal with literature reviews and statistical results. In this document Chapter 1 presents a comparison of task definitions as found in the leading job analysis methodologies currently in use. Chapter 2 reports on the pilot and field tests of the HSMS task definition and method, and discusses its reliability and validity. Chapter 3 presents the revisions in the definition and method which were warranted as a result of the statistical results of the pilot test and experiences with the method in the field.

Research Report No. 3. Part B: Skill Dimensions of Tasks.
Volume III: Data on Skill Scaling.[6]

In this document Chapter 1 briefly reviews the need for skill dimensions in job analysis, the literature in the field, and describes the development of the HSMS skill scales. Chapter 2 reports on the field tests of the scales and indicates the revisions which were adopted as a result of analysis of the pilot test data.

Research Report No. 3. Part C: Knowledge Identification and Scaling of Tasks. Volume III: Clustering Tasks Through Factor Analysis.[7]

This volume will be of interest to those who are applying the HSMS method and plan to include the stage of computer-based clustering of

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5 Part A, Volume III, Part B, Volume III, and Part C, Volume III are all currently bound together in a three-part document.

6 Ibid.

7 Ibid.

tasks. Chapter 1 presents tentative results on the first field test using the Knowledge Classification System and the Knowledge Scale. Chapter 2 describes the preparation of the data and the decisions made in preparation for factor analysis. Chapter 3 describes the factor analysis work and how analysis of the results is accomplished.

Research Reports Nos. 4 and 5

This document is entitled, Suggestions for Job and Curriculum Ladders in Health Center Ambulatory Care; A Pilot Test of the Health Services Mobility Study Methodology.[8]

This Report will be of interest to several types of audiences. First, as a report on the methodology, it will be of interest to anyone concerned with providing upward mobility and/or relieving upper level shortages. Second, for those concerned with providing upward mobility within patient care, the actual content of the pilot test titles and tasks and the recommended ladders have generalizable relevance. Third, for those concerned with providing the education for health care occupations, the skill and knowledge content of the results will also provide informative and suggestive insights. Finally, anyone interested in health care service delivery or in health manpower should find something of interest

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[8] By Eleanor Gilpatrick. The reader will note that the Report is listed as Research Reports Numbers 4 and 5. The original plan was to have separate reports on the job ladders and on the related curriculum ladders. However, once the analytical work was near completion, it became apparent that the two parts are too intimately intertwined to be presented as two separate documents. Since Research Reports Numbers 4 and 5 constituted the "Final Report" contracted for with the Health Services and Mental Health Administration, the designation was retained.

in the Report. The document has been submitted to review for possible publication, but a small quantity is available for distribution.

This document reports on an enormous amount of data. To provide the most readable and interesting format, much of the raw data, which would require several volumes, are not presented. The reader will be able to obtain raw data to meet his needs by contacting the Health Services Mobility Study. Appendix tables provide most of the background data needed for the reader who wishes fuller elaboration of the statements in the text.

Chapter 1 tells the reader about the approach of the Health Services Mobility Study and sets the methodology within a framework of current manpower problems in the health services industry. It also provides a summary of the pilot test results. Chapter 2 describes the HSMS methodology as it was applied, and presents a description of the pilot test and the titles it covered. Chapter 3 discusses the general results of the pilot test and their implications. Chapter 4 goes into greater detail and presents the actual task sequences identified by the method and the related curriculum content requirements. Chapter 5 talks about practical application of the results in job restructuring and curriculum, assuming no desire for major reorganization. Chapter 6 discusses more idealized applications of the results and presents job ladders that require job restructuring and redesigned curricula, assuming a willingness on the part of the institutions to undertake major reorganization. Chapter 7 comments on general policy and describes the spin-off applications of the method in performance evaluation and curriculum design.

Research Report No. 6

This report, A Model for the Use of Task Data in Performance Evaluation and Trainee Selection[9] focuses on the use of task data for the purpose of establishing objective, work-related standards for the evaluation of institutional or employee performance and for use in trainee selection in job ladder sequences. The document is available for "limited distribution," but has not yet been updated to reflect revisions made in the method during the pilot test.

Chapter 1 presents a brief review of the HSMS job analysis methodology and its data outputs. Chapter 2 provides a model for the normative evaluation of an institution's functioning in any specific area or in an individual or group of job titles. Chapter 3 deals with the more complicated model needed for trainee selection when prediction becomes relevant. Chapter 4 is addressed to the reader who is concerned with the methodological problems involved in predictive models. Chapter 5 offers a model which might be attempted if the HSMS premises for trainee selection were to be tested in an experimental design. The average reader will find that Chapters 1 through 3 are most relevant to his needs; the researcher will also wish to examine Chapters 4 and 5.

Working Paper No. 10

Working Paper No. 10 is entitled, Preliminary Models for Curriculum Analysis and Curriculum Ladder Design Using Task Data. The volume

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[9] By Earl E. Davis and Eleanor Gilpatrick.

is a tentative working model designed to be used in conjunction with task data resulting from the HSMS job analysis methodology. Some copies are available for distribution.

The purpose of this document is to present models which can be used in the curriculum analysis and design needed for educational ladders. It must be understood, however, that this document does not deal with the field of educational psychology in terms of how people learn or how to teach so that maximum learning is accomplished. It does not take a position on possible choices between classroom and clinical training. It does offer several insights into these areas.

Chapter 1 outlines the three types of curriculum analysis dealt with in the document and introduces some problems inherent in the use of task data for curriculum design. The three types of analysis are (1) to discover curriculum overlap, (2) to determine whether required parts of curricula are in fact needed, and (3) the design of curriculum ladders. Chapter 2 raises some conceptual and analytical problems involved in the appropriate use of task data for curriculum analysis and design, comments briefly on the literature in the field, and offers a tentative definition of a curriculum unit. Chapters 3, 4 and 5 present the actual models for the three analytical purposes. Chapter 3 presents two analytical models which accept existing courses and seek only to identify and eliminate redundancy. Chapter 4 presents an analytical model for assessing the justification for requirements in programs leading to licensure, degrees,

or certification in relation to the work objectives involved. Chapter 5 discusses the HSMS approach to the design of curricula which articulate with one another and reflect job ladders. It shows how task data and the analytical approach of the HSMS method can be both useful and suggestive with respect to curriculum content.

CHAPTER 6

FUTURE PLANS

The work of the Health Services Mobility Study has been conceived of by its Director as a combination of short and long range work objectives and applications. In short range terms, every phase along the way has usable results on at least three levels of application.

First, by virtue of the policy and strategy approaches implicit in the work, there have been usable strategies for others to apply. This has already resulted in changes in the thinking and policy of a considerable number of members of the health care community. Second, with the refinement of the method manuals and the job analyst training manuals the methodology has been and will continue to be directly usable by a limited number of institutions who wish to apply the method themselves. Third, the most widespread applications will be for those who wish to have access either to the data or to the prototypes and recommendations. Almost all of the applications described in Chapter 4 reflect this level of usage to one degree or another.

The work of task analysis alone could continue for a very long period of time considering the thousands of separate activities which are engaged in by health care institutions. After the design of job ladders and lattices, the work in developing instruments for performance evaluation as described in the model could also take a major research effort. This is equally true for the work in curriculum analysis which would result in educational ladders to match the job ladders.

In long range terms, Phases I, II and III represent developmental and pilot test phases. Now that the pilot test has been successful, the Demonstration Phase begins. In the coming months the Project will collect further data which will lead to additional proposals for job ladders in health occupations. Although the method will be available to users through HSMS publications, the main focus of the Health Services Mobility Study will be as the prime agent in applying the method and in providing technical support in disseminating and applying the results.

In the coming period the method will be refined and applied, and the results will be offered to the health community at large. It is also expected that developmental work will be done in the two related areas of curriculum analysis and design to parallel the job ladders, and in the application of the model for performance evaluation. Eventually, there could be an ongoing utilization of the methodology as a service function for the industry as a whole.

IMMEDIATE PLANS

The new funding period (starting in April, 1972) has some specific objectives to be achieved within the framework of the longer range objectives. They are as follows:

1. Collect task data in a major voluntary hospital; develop and recommend job ladders; and disseminate findings.
2. Make final revisions of the job analysis methodology and make this available.
3. Continue to develop and apply the work in performance evaluation and curriculum analysis to dovetail with the job

ladder recommendations; do this in cooperation with several health services institutions which indicate the possibilities of immediate application. This includes the development of guidelines for a curriculum ladder including an allied health occupation.

4. Make available basic task data, and provide guidance in their use at selected institutions.

5. Provide documentation as follows:

   a. Final Method Manuals.
   b. Reports on job and curriculum ladder recommendations to be used as prototype models.
   c. Progress reports on application experiences.

These limited objectives for the next eighteen month period take the Project nearer to its goal of promoting career mobility. They also provide for the immediate needs of the institutions in which the work will be done. The Project has already received requests to work with several institutions. In addition, the outputs of the period will provide other institutions with material for the varied uses to which the data and recommendations can be put.

The Health Services Mobility Study is happy to announce that the Demonstration Phase, which is the next funding period, will be jointly supported by the Manpower Administration of the Department of Labor and the Division of Allied Health Manpower, Bureau of Health Manpower Education of the Department of Health, Education and Welfare.

DETAILED PLANS

Task data will be collected at the Montefiore Hospital and Medical Center and will include nursing and X-ray functions among others

not yet specified. Task analysis at Montefiore is attractive for several reasons. First, this is a major voluntary hospital, and any results would have wide applicability. Second, since the Dr. Martin Luther King, Jr. Center is a part of the Montefiore complex, there is the possibility of doing task clustering with the data from both institutions. It would then be possible to identify mobility paths into and out of the two locations. This should be of great interest to many ambulatory care centers and especially to OEO Centers, since there has long been a problem in placing workers with Center-specific titles in other institutions at economically attractive levels. There will be the potential of comparing functions across locations. Third, Montefiore was the site of some of our early field testing,and warm relationships have been established with many people on the staff. This will greatly facilitate the work. Finally, Montefiore is one of the more innovative of the great voluntary hospitals, and the possibility that recommendations can be implemented is very good.

In the new funding period the method manuals will be revised to incorporate the findings of the pilot test. The resulting document(s) will be offered for publication and will be available for distribution to appropriate non-profit organizations.

In the coming period HSMS expects to provide major inputs to several educational institutions and expects to develop a curriculum analysis methodology in cooperation with their staff members. The Project will develop the guidelines for at least one educational ladder with at least one credentialed institution.

Eugenio Maria De Hostos Community College is a part of the City University of New York. Apart from the fact that it serves the South Bronx and is located near Montefiore and the Dr. Martin Luther King, Jr. Center, it is important because it is C.U.N.Y.'s flagship community college for health occupation training. From its inception, its new President, Candido deLeon,saw that its modular approach to education and its emphasis on health occupations makes it a natural focus for job ladders. The City University complex also incorporates a senior college program in health occupations at the Hunter College Institute of Health Sciences and at the Mt. Sinai Medical School. Thus, the potential for curriculum articulation exists.

The Study will be undertaking a cooperative venture with several outlying institutions. One of these is Community-General Hospital of Greater Syracuse where aspects of the HSMS approach have already been applied. Task data which reflect activities at Syracuse will be used to help revise and evaluate in-house training and performance. The work in the area of curriculum will also be made available and important results will be reported. The application of the methodology to Syracuse is significant because this hospital is a prototype for suburban, medium-sized hospital centers across the country.

We hope that the staff of the Dr. Martin Luther King, Jr. Center will find the results of the task analysis work useful and will wish to continue to cooperate in the application of the job ladder recommendations and the performance evaluation and curriculum analysis methodol-

ogy. This experience will round out the relationship with the parent organization at Montefiore and the key educational institutions. The results should have wide applications.

A number of institutions have expressed an interest in the task data for a variety of applications. All technical support and co-operative work will be reported in progress reports. Three requirements will have to be met before any technical support is provided:

1. The institution must be a primary user such as a health care delivery institution or an educational institution.

2. The institution must agree to use the basic data solely for internal needs and must agree not to turn these over to secondary users.

3. The institution must agree to report on its experience with the material and data so that the results can be disseminated.

The Project embarks on its Developmental Phase with the good wishes of many friends and hopes to earn many more in the coming period by delivering materials which are needed and usable by the health community at large.

SELECTED BIBLIOGRAPHY

1. Altman, James W., Research on General Vocational Capabilities (Skills and Knowledges), Final Report, Pittsburgh: American Institutes for Research, 1966.

2. Anastasi, Anne, Psychological Testing, New York: The Macmillan Company, 1961.

3. Anderson, O. R., Structure in Teaching, New York: Teachers College Press, 1969.

4. Ausubel, D. P., "The Use of Advance Organizers in the Learning and Retention of Meaningful Verbal Material," Journal of Educational Psychology, LI, 1960, 267-272.

5. Barlow, Melvin L., et al., Research and Demonstration Project for Curriculum Development and Teacher Education in the Allied Health Occupations, Various Reports, University of California at Los Angeles, Division of Vocational Education, Allied Health Professions Project, 1969-1972.

6. Beauchamp, G. A., Curriculum Theory, Wilmette: Kagg Press, 1961.

7. Bloom, B. S. (Ed.), A Taxonomy of Educational Objectives: Handbook I, The Cognitive Domain, New York: Longmans, Green, Co, 1956.

8. Bright, James R., "The Relationship of Increasing Automation and Skill Requirements," in The Employment Impact of Technological Change: Technology and The American Economy, Appendix Volume II, Washington, D. C.: the National Commission on Technology, Automation, and Economic Progress, 1966, 201-316.

9. British Standards Institute, Universal Decimal Classification System, London: International Commission on Decimal Classification of the International Federation For Documentation, etc., 1961.

10. Bruner, J. S., The Process of Education, Cambridge: Harvard University Press, 1962.

11. Cain, Glen, Hansen, W. Lee, and Weisbrod, Burton A., "Occupational Classification: An Economic Approach," Monthly Labor Review, Vol. 90, No. 2, Feb., 1967, 48-52.

12. Christal, Raymond E., "Implications of Air Force Occupational Research For Curriculum Design," Report Available from Minnesota Research Coordinating Unit for Vocational Education, University of Minnesota, undated.

SELECTED BIBLIOGRAPHY (continued)

13. Crawford, Meredith, Concepts of Training, in Robert M. Gagné (Ed.), Psychological Principles in Systems Development, New York: Holt, Rinehart and Winston, 1962.

14. Cronbach, L. J., Essentials of Psychological Testing, New York: Harper and Brothers, 1960.

15. Davis, E. E., "Methodological Study of Behavioral and Semantic Differential Scales Relevant to Intercultural Negotiations," Technical Report #32, ONR Contract #177-442 Nonr-1834 (36), Urbana: University of Illinois, 1966.

16. Davis, E. E., Triandis, H. C., An Exploratory Study of Intercultural Negotiations, Technical Report #26, ONR Contract #177-472, Nonr-1834(36), Urbana: University of Illinois, 1965.

17. Decker, John P., A Functional Analysis of Paramedical Occupations as a Foundation for Curriculum Development, Phoenix, Arizona: Health Services Education Association, 1967.

18. Edwards, Allen, Techniques of Scale Construction, New York: Appleton-Century-Crofts, Inc., 1957.

19. Fine, Sidney A., A Systems Approach to Job Design and Manpower Utilization, Seminar Workshop (in 5 Parts), Washington, D. C.: The W. E. Upjohn Institute for Employment Research, 1969.

20. Fine, Sidney A., Functional Job Analysis Manual, Manpower Data Collection Study--Phase II, Washington, D. C.: The W. E. Upjohn Institute for Employment Research, undated.

21. Fine, Sidney A., "Nature of Skill: Implications for Education and Training," Proceedings, 75th Annual Convention of the American Psychological Association, 1967, 365-6.

22. Fitts, Paul M., Posner, Michael I., Human Performance, Belmont, California: Brooks/Cole Publishing Company, 1967.

23. Fleishman, Edwin A. and Hempel, Walter E., "A Factor Analysis of Dexterity Tests," Personnel Psychology, Vol. 7, 1954, 15-32.

24. Fleishman, Edwin A., "Dimensional Analysis of Psychomotor Abilities," Journal of Experimental Psychology, Vol. 48, No. 6, 1954, 437-454.

25. Fleishman, Edwin A., "Dimensional Analysis of Movement Reactions," Journal of Experimental Psychology, Vol. 55, No. 5, 1958, 438-453.

SELECTED BIBLIOGRAPHY (continued)

26. Fleishman, Edwin A., and Ellison, Gaylord D., "A Factor Analysis of Fine Manipulative Tests," Journal of Applied Psychology, Vol. 46, No. 2, 1962, 96-105.

27. Fleishman, Edwin A., "The Description and Prediction of Perceptual-Motor Skill Learning," in Robert Glaser (Ed.), Training Research and Education, New York: J. Wiley and Sons, Inc., 1962, 137-176.

28. Freeberg, Norman E., "Construct Validity of a Paper-and-Pencil Test of Manual Dexterity," Perceptual and Motor Skills, Vol. 22, No. 1, 1966, 200.

29. Gagné, R. M., The Conditions of Learning, New York: Holt, Rinehart and Winston, 1967.

30. Ghiselli, E. E., The Measurement of Occupational Aptitude, Berkeley: University of California Press, 1955.

31. Guilford, J. P., The Nature of Human Intelligence, New York: McGraw-Hill Book Co., 1967.

32. Haggard, Donald F., The Feasibility of Developing a Task Classification Structure for Ordering Training Principles and Training Content, Fort Knox, Kentucky: U. S. Army Human Research Unit, 1963.

33. Harman, Harry H., Modern Factor Analysis, Chicago: University of Chicago Press, 1967.

34. Hays, W. L., Statistics, New York: Holt, Rinehart and Winston, 1963.

35. Hempel, Walter E., Jr., and Fleishman, Edwin A., "A Factor Analysis of Physical Proficiency and Manipulative Skill," Journal of Applied Psychology, Vol. 39, No. 1, 1955, 12-16.

36. Hull, C. L., Aptitude Testing, Yonkers, New York: World Book Company, 1928.

37. Inlow, G. M., The Emergent in Curriculum, New York: John Wiley & Sons, Inc., 1966.

38. Jackson, Vivian C., Task Analysis, A Systematic Approach to Designing New Careers Programs, New York: New Careers Training Laboratory, New York University, 1971.

39. Jones, Francis E., A Systematic Analysis of Army Training Requirements as the Basis of More Generalized Training Research, Arlington, Virginia: Armed Services Technical Information Agency, 1961.

SELECTED BIBLIOGRAPHY (continued)

40. Kibler, R. J., Barker, L. L., and Miles, D. L., Behavioral Objectives and Instruction, Boston: Allyn and Bacon, Inc., 1970.

41. King A. R., and Brownell, J. A., The Curriculum and the Disciplines of Knowledge, New York: John Wiley & Sons, Inc., 1966.

42. Kirkpatrick, J. J., Ewen, R. B., Barrett, R. S., and Katzel, R. A., Testing and Fair Employment, New York: New York University Press, 1968.

43. Klaus, E. J., Gosnell, D. E., Reilly, P. A., Taylor, J. A., Controlling Experience to Improve Nursing Proficiency: Categories of Nursing Performance, Report No. 2, Pittsburgh, Pennsylvania: American Institutes for Research, 1968.

44. Klaus, D. J., Gosnell, D. E., Chowla, M. J., Reilly, P. A., Controlling Experience to Improve Nursing Proficiency: Determining Proficient Performance, Report No. 3, Pittsburgh, Pennsylvania; American Institutes for Research, 1968.

45. Krathwohl, D. R., The Taxonomy of Educational Objectives - Its Use in Curriculum Building, in C. M. Lindvall (Ed.), Defining Educational Objectives, Pittsburg: University of Pittsburg Press, 1964.

46. Levin, Tom, Russell, Tanya, Lesh, Seymour, et al., "Transitional Report of the Curriculum Research Group," Transitional Report, Albert Einstein College of Medicine - Lincoln Hospital Health Careers Program, New York: Unpublished, 1968 (Two Volumes).

47. Lopez, F. M., Evaluating Employee Performance, Chicago: Public Personnel Association, 1968.

48. Mager, R. F., Preparing Instructional Objectives, Palo Alto, California: Fearon Publishers, 1962.

49. Miller, R. B., "Task Description and Analysis," in R. M. Gagné, (Ed.), Psychological Principles In System Development, New York: Holt, Rinehart and Winston, 1966, pp. 187-228.

50. Morsh, Joseph E., Madden, Joseph M., Cristal, Raymond E., Job Analysis in the U. S. Air Force, Arlington, Virginia: Armed Services Technical Information Agency, 1961.

51. Morsh, Joseph E., "The Analysis of Jobs--Use of the Task Inventory Method of Job Analysis," in Edwin A. Fleishman (Ed.), Studies in Personnel and Industrial Psychology, Homewood, Illinois: The Dorsey Press, 1967, 4-11.

SELECTED BIBLIOGRAPHY (continued)

52. National Seminar on Modular Flexible Scheduling, The Flexibly Scheduled School of 1980: A Report, Dayton: Institute for Development of Educational Activities, 1971.

53. Otis, Jay, and Leukhart, Richard H., Job Evaluation: A Basis for Sound Wage Administration, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1954.

54. Parker, James F. Jr., Reilly, Raymond E., Dillon, R. F., Andrews, Thomas G., Fleishman, Edwin A., Development of a Battery of Tests For Measurement of Primary Perceptual-Motor Performance, Arlington, Virginia: BioTechnology, Inc., 1965.

55. Saunders, D. R., "Moderator Variables in Prediction," Educational and Psychological Measurement, 1956, Vol. 16, 209-222.

56. Seashore, Robert H., "Work and Motor Performance," in S. S. Stevens (Ed.), Handbook of Experimental Psychology, New York: J. Wiley and Sons, 1951, 1341-1362.

57. Sjogren, Douglas, and Sahl, Robert, Review of Research on Common Job Behaviors, Washington D. C.: Bureau of Research, Office of Education, U. S. Department of Health, Education, and Welfare, 1966.

58. Sjogren, Douglas, Schroeder, Wayne, Sahl, Robert, The Identification of Common Behavioral Factors as Bases for Pre-Entry Preparation of Workers for Gainful Employment, Washington D. C.: Office of Education, U. S. Department of Health, Education, and Welfare, 1967.

59. Smith, B. O., Fundamentals of Curriculum Development, Yonkers-on-Hudson: World Book Company, 1957.

60. Springer, Doris, "Ratings of Candidates for Promotion by Co-workers and Supervisors," in, T. L. Whisler and Shirley F. Harper (Eds.), Performance Appraisal: Research and Practice, New York: Holt, Rinehart and Winston, 1962.

61. Stolurow, L. M., Peterson, T. I., Cunningham, A. C., (Eds.), Computer Assisted Instruction in the Health Professions, Newburyport, Massachusetts: ENTELEK, Inc., 1970.

62. Swenson, Gardner, Providing for Flexibility in Scheduling and Instruction, Englewood Cliffs, N. J.: Prentice-Hall, 1966.

63. Tucker, L. R., "The Extension of Factor Analysis to Three-Dimensional Matrices," in Fredericksen (Ed.), Contributions to Mathematical Psychology, New York: Holt, Rinehart, and Winston, 1964.

SELECTED BIBLIOGRAPHY (continued)

64. Tucker, L. R., "Some Mathematical Notes on Three-Mode Factor Analysis," Psychometrika, Vol. 31, 1966, 279-311.

65. Tucker, Ledyard R., and Messick, Samuel, "An Individual Differences Model for Multidimensional Scaling," Psychometrika, Vol. 28, December, 1963, 333-367.

66. U. S. Department of Labor, Bureau of Employment Security, Dictionary of Occupational Titles, Volume I: Definitions of Titles; Volume II: Occupational Classification; and Supplement, Washington, D. C.: Superintendent of Documents, 3rd edition, 1965.

67. U. S. Department of Labor, Manpower Administration, Bureau of Employment Security, Training & Reference Manual for Job Analysis, Washington, D. C.: U. S. Government Printing Office, 1965.

68. U. S. Department of Labor, Manpower Administration, A Handbook For Job Restructuring, Washington, D. C.: U. S. Government Printing Office, 1970.

69. Verdier, Paul A., Basic Human Factors for Engineers: The Task Analysis Approach to the Human Engineering of Men and Machines, New York: Exposition Press, 1960.

70. Wallenstein, Robert J., Knowledges Commonly Useful in Twelve Allied Health Occupations, Project No. OE 7-0031; Contract No. OE G-4-7-070031-1626; Report No. 25, Washington D. C.: Department of Health, Education and Welfare, 1968.

71. Willard, Richard, A School Schedule Building System Designed for Educational Administrators, Unpublished Ed.D. Dissertation, Cambridge: Harvard University Graduate School of Education, 1969.

72. Wheaton, G. R., Farina, A. J., Baker, W. J., in E. A. Fleishman, R. G. Kinkade, A. N. Chambers, (Eds.), Development of a Taxonomy of Human Performance: A Review of the First Year's Progress, Technical Progress Report 1, Silver Spring, Maryland: American Institutes For Research, 1968.

APPENDIX A

A GLOSSARY OF CAREER MOBILITY TERMS

Occupational Mobility is the movement of individuals from one job to another within institutions or across institutions. Upward mobility implies that the movement is in the direction of increased status, income or responsibility. The term is to be used here in the context of a single institution. It is assumed that if an institution is structured so as to provide opportunities for upward occupational mobility for its employees, they will, in turn, be motivated to remain, and to improve their work performance.

The provision of opportunities in an institution for occupational mobility need not imply that all employees want it, that all are competent to achieve it, nor that all can expect it. In providing opportunities for upward mobility, the institution provides itself with a source from which to draw on to fill upper-level vacancies and solve shortage problems, as well as a way to reward employees who can and wish to move ahead.

Job Families are groupings of jobs which are related because they draw on similar skills and subject matter. These are also called job clusters. A given job family would include upper, middle, and lower level jobs, and perhaps have several jobs at a given wage level. The similarity of skills and knowledge required among jobs in a family implies that experience in one is easily transferred to the work in another. Movement between jobs at a given level would therefore require a minimal amount of additional training. The transferability of training to higher levels within a family assumes that there is a common educational base on which to build. It is assumed that moving up within a job family would require a minimum of additional training for the employee rather than his being introduced to totally new sets of skills and knowledges.

Job Ladders are sequences of promotional steps linking jobs which ideally should be in the same job families. Traditional job ladders in industry provide such steps where no additional formal education has been needed to move up a ladder. In the health field, however, there are educational barriers to upward movement because experience in the lower-level job may not be sufficient for performance in the next higher job. Therefore, the ladders cannot be promotional unless the required additional education is provided to trainees while they are in the lower-level jobs. The ladder concept refers to the relationship of jobs rather than individuals.

Career Ladders are the same as job ladders except that the term implies that a professional job is reached at the top of the ladder. Therefore, it is most probable that promotional lines in career ladders are not achievable without the provision of formal educational programs as well as any relevant on-the-job training.

Job Lattices or Career Lattices are networks of job ladders which allow for linkages of laterally related jobs. That is, entry-level and intermediary-level jobs which are related to more than one job family can be rungs on several job ladders. Where there is transferability of skills and knowledge at a given level there can be cross-over options and a choice of promotional pathways. The principle involved is that the skills and knowledge used in a given job may serve as a basis for more than one specialty, and that a given specialty may build on more than one kind of prior preparation. The entry to specific professional jobs could be reached in a lattice by more than one promotional line or sequence. Conversely, a given entry level job could be the first step towards more than one profession.

Upgrading (when the term is applied to an employee) is the movement from one title and wage level up to a new job title at a higher wage level in a given institution. "Promotion" is a synonym. Movement along a job ladder is one form of upgrading.

Upgrading Training is the training of an employee while he is employed in a current job to qualify for a higher-level job. Upgrading training in a career ladder means that preparation for a higher-level, related job builds on the skills and knowledge required in the current job.

Educational Ladders are series of related educational courses or programs which fulfill the educational requirements for all the jobs in a ladder and which provide for continuous educational movement along the ladder from entry level to professional levels, but with exit credentials for all the intermediary jobs involved along the way. Ideally, such a program would not require repetition of course work and would be designed so that educational institutions at higher levels would accept the course work at lower levels.

Career ladders in health cannot be planned without planning educational ladders. This is because the upper-level jobs are usually reachable only through degree, licensure, or other credential requirements. At present, curricula for health occupations are terminal in nature, and movement from one job level to another requires "starting from scratch" in each course of study.

Career Mobility Program is an interrelated set of programs within an institution to implement the concept of promotion from within. It includes the provision of the necessary education and training. The components would include identification of the sequences, i.e., the entry-level, intermediary and professional-level jobs involved. (There would normally be shortage occupations at upper levels.) There would be provision for proper educational courses, credentialing, released-time training, and an orderly sequence of trainee selection, trainee evaluation, and placement. With this might go remedial training, counseling, and a general orientation of supervisory personnel to the program.

Job Analysis is any process of identifying and evaluating the work activities associated with a given job title. The methods vary according to purpose. The industrial engineer is concerned with work sequences and time; the wage and salary administrator attempts to isolate and rate activities in terms of payment levels. For the purpose of career ladder development, job analysis breaks work into activities whose skills and knowledge requirements can be identified and rated.

Task Analysis is a form of job analysis in which the work activities of a job are separately identified and studied. Any given person's job is the sum of the work activities or tasks assigned to him or done by him. Task analysis may include identifying and rating the skills and knowledge needed for each task. The unit of work activity called the "task" usually is of such a size that a meaningful production output can be associated with it and it can be shifted from one job to another. The interrelationship of tasks is what underlies the development of job families and the creation of job ladders and lattices.

Job Restructuring is the process of reorganizing or reassigning work activities to a job title or to an employee in a job. When there are vacancies at high levels and impacted workers at low levels in a job family, it is often possible to create intermediary jobs to form a ladder. This can also mean identification of tasks assigned to several jobs so that they can be assigned to a job at an appropriate level. It can also mean assigning tasks to jobs so that jobs are composed of tasks which draw on related skills and knowledge at similar and appropriate levels. Job restructuring in these instances permits the institution to conserve its supply of highly skilled and educated manpower by making maximum use of their training. At the same time, it makes it possible for lower level staff to rise to higher income and more productive work in a relatively short space of time.

When it is recognized that there is transferability within skill and knowledge categories the jobs on ladders need not be made up merely of repetitive task assignments. Job enlargement within broad skill and knowledge families can be achieved by increasing the variety of tasks using similar skills and knowledges.

Exemptions, Waivers and Advanced Standing are offered by schools that acknowledge that a given trainee does not require specific parts of course programs. Since an expensive part of career ladder programs is the tuition and training costs, there is an advantage in eliminating overlapping course requirements. In addition, prior job exerience and prior educational experiences may often make certain required course work unnecessary and redundant for certain individuals. Course credits need not always be provided; sometimes requirements are simply eliminated. Where a fixed number of accumulated course credits are required, however, exemption with credit or advanced standing for proved achievement levels is a desirable objective. Such arrangements can be worked out and applied in cooperation with state educational bodies and educational institutions.

Proficiency Examinations measure the competence of individuals with respect to specific work or related activities or with respect to academic achievement. Proficiency examinations for academic course work are sometimes called equivalency examinations, while examinations to determine work proficiency levels may be called performance evaluation tests or work sampling tests. Licensure examinations may cover both academic and work content.

In contrast, aptitude tests do not directly measure academic or work proficiency, but, indirectly, through the use of selected test items, attempt to measure potential to do work or predict success in the future in certain broad lines of endeavor.

Equivalency Tests are geared to find whether a given individual can be considered to have achieved the level of knowledge represented by specific educational programs or courses at given academic levels. Grades on such examinations are used for exemption of individuals from required courses, for exemptions with course credits, or for entrance with or without advanced standing into course programs.

The General Equivalency Diploma Exam (or High School Equivalency Diploma Exam) tests for academic knowledge at the high school level. No formal educational courses are required to take the examination; persons who successfully pass are awarded a High School Equivalency Diploma which enables them to qualify for jobs which require a High School Diploma. Many colleges accept the Equivalency Diploma for admission to course work, and thus the way is open to the next educational rung.

The College Level Examination Program is a national program of examinations developed by the College Entrance Examination Board. It can be used to evaluate the college level achievement of persons without formal education. An individual can obtain credits and advanced placement within an academic program by virtue of his test scores. Persons in career ladder programs can therefore enter into advanced programs.

In New York State the College Proficiency Examination Program develops tests to evaluate the extent to which individuals display a knowledge of specific courses. These cover a range of academic subjects, as well as professional courses such as nursing subjects, on both the associate and baccalaureate degree levels.

Performance Evaluation refers to tests of work performance. Since courses for health occupations include clinical work, life experience may often be the source of learning of required skills. Tests which evaluate work performance may thus be used for credits, advanced standing, or exemptions. They can also be used for trainee selection and evaluation.

Core Curriculum refer to educational course materials which are common requirements for a number of programs. These units of study can therefore be offered to students preparing for various jobs in a ladder or several different jobs in a lattice. Once they are identified they provide the basis for breaking up curricula into units which need not be repeated once they are taken, regardless of which educational program claims them.

Career Mobility Consortia is an association of institutions who wish to achieve a common end through the pooling of resources. Career ladder programs require the cooperation of hospitals, educational institutions, professional associations, and government. They also require a large enough number of workers-in-training to be economically feasible. For small hospitals a pooling of efforts can make possible access to facilities, special programs and funding which might not be available to them as single entities. The consortium is therefore a means of achieving the purposes of a career mobility program.

APPENDIX B

TECHNICAL SUPPORT FOR BUILDING JOB AND EDUCATIONAL LADDERS

Oral Presentation to the National Manpower Policy Task Force
Conference on Upgrading and New Careers
March 20, 1970

The Health Services Mobility Study is funded by OEO, Labor and the Public Health Service. The topic of my presentation, "Technical Support for Building Job and Educational Ladders," describes our project. We are developing and testing a methodology which can be viewed as a technology for designing job ladders and the educational ladders needed to carry people up the job ladders. Our support function lies in our teaching the method, helping others to use it,and reporting our own results. Our method is generic to any industry; however, we are working primarily with health care jobs.

You have before you a two-part document. The first will be more or less adhered to in my oral presentation. Since I did not wish to take the time in these short 15 minutes to describe the methodology which we are developing in detail, this is done in the second section of the document you have before you.[1] Suffice it to say that our method is based on the assumption that, if we could identify and rate the skills and knowledge which are required in job tasks, we could develop promotional ladders within institutions which would reflect the interrelatedness of tasks. This would take advantage of the transferability and hierarchical relationship among levels of skill and knowledge, and would

[1] The second part was a description of the methodology and is not presented here.

minimize the amount of training effort required to move people up within organizational contexts.

CONCEPTUAL ISSUES

I wish to step back from a description of our approach for the moment and direct my main attention to the key issues, as I see them, which surround the relevance of possibilities for successful implementation of any technical support we could offer. Two of the issues are highlighted by language in the Conference agenda itself; I will raise two others with you as well.

Why New Careers?

The title of this Conference is "Upgrading and New Careers," and herein lies a problem. I should like to make it very clear that I do not endorse the concept of new careers, per se. The reason is that I object to this stress on the word "career" and the stress on the word "new." I think that these qualities could be side effects of what is done in the area of manpower development, but they cannot be the points of origin. What I mean is this: if you conceive of an industry having labor requirements for the production of goods and services, with the proportions of jobs needed to produce these goods and services increasing in the middle and upper skill levels, then we can understand why we find increasing shortages in the middle and upper skill levels, and hard core unemployment a continuing problem. The health industry is a prime example of an industry with growing shortages at levels which require education-

ally-based skill and knowledge training, much of it credentialed, and with few low level shortages.

It becomes increasingly important for institutions to be able to draw on their own internal labor forces so that their people at bottom levels can move up to fill these deepening higher level shortages.

In such a context the word "upgrading" is meaningful and the words "job ladder" are meaningful, but the words "career" and "new" are not necessarily meaningful. It may be that an upgrading sequence truly offers the quality of "career" at the end. But to talk about entry level jobs or those one step up as "careers" is clearly a misnomer and a euphemism. And whether or not the restructuring which often is required for building ladders necessarily produces something new, is really a function of the goods and services which are demanded, as these change, and the technologies used to produce them, as these change.

Given this context, "upgrading" has a meaning in terms of the organic requirements of industry (in any kind of a market economy, free or otherwise). The focus would be, in such a context, on the provision of technical support to permit industry, both public and private, to make maximum use of existing manpower with a minimum amount of training time involved.

Training workers for entry level (or para-professional) work, then, is put in its proper focus. It is a response to newly opened entry level jobs which have been vacated by upgraded workers, and not the orig-

inating push against the already impacted, entry-level employed poor. This is a different context, I suggest, than the one which is the basis for much poverty legislation. That approach views the poor as unemployed, as hard core, and as handicapped, and sets out to provide jobs in an economic vacuum, ignoring organizational or labor market functioning, in a context of altruism.

An Industry Is An Industry

My second objection to language is in the same vein. It relates to the fact that this No. II Session is called, "Federally Supported Upgrading In Industry" and Session IV is called, "New Careers and the Service Sector." The idea that industry means private sector, non-service, and that you don't have an industry when it is service or public sector, is totally alien to my thinking as an economist.

It seems to me that every industry, private or public, every industry, goods-producing or service-producing, has got to put together labor and capital and management know-how in the production of goods and/or services. To differentiate among these in terms of appropriate manpower policy, I believe, leads us down the wrong track. It has made it possible, it seems to me, to separate what is being done in manpower development in the service sector from the hard thinking of cost analysis and of systems approaches. I think that this is a disservice, not only to manpower policy, but to the people and organizations involved.

I have the abiding faith that, if a solution is inorganic and not appropriate to its context, it will not be long sustaining or self-sustaining. And if it is not long sustaining, and if government manpower policy has been built around fostering programs which are not essentially self-sustaining in organizations, then we face the danger that the entire attention to <u>having</u> a manpower policy will be discredited. What should be discredited are ill-conceived programs which do not reflect the realities of industrial and human systems.

Job Ladders and Educational Ladders

Our methodology starts with task analysis of the work being done in the organization. After job analysis and job ladder design we will be identifying the curriculum ladders needed for the upgrading of the employees involved. At this point we run into another major conceptual problem.

It has been traditionally assumed that when someone is going to school he is not a worker, and that when he is a worker he is not going to school. Labor force participation has been considered to be essentially incompatible with educational participation. This means that the educational system, per se, is not geared to the needs of employed workers who may be studying on a half-time basis in preparation to moving up in a related skill and knowledge hierarchy. It also means that educational programs are all terminal in concept: at the high school level, in a technical school, in a community college - and even beyond. This creates redundancies in curriculum requirements for upwardly mobile people. For

example, the nurse aide is trained, but gets no advanced standing in a Practical Nurse school. The LPN is trained, but gets no credits towards an associate degree in nursing (RN). The associate degree nurse has great difficulty getting two years of advanced credits in a baccalaureate degree nursing program.

All of this has separated "training" from "education" to the detriment of those who are required to have formal education to reach the upper level jobs in their industry. Another result is that the educational system itself has not really seen its function in the whole area of manpower development. In addition, Government legislation in the field of manpower development has not been built around the existence of educational institutions (formal, credentialed educational institutions). Please notice that there is not one educator here today.

I am setting aside for the moment the question of whether credentialed occupations and those which require formal, higher education require these for prestige or because the skills and knowledges can only be obtained that way. I think we can show that there are sufficient numbers of industries in the economy which more and more have need of educationally-based skills and knowledge.

The separation of legislation into manpower bills and educational bills, with the same people never being seen as coming under both, puts an undue burden on the employer. He is faced with the problem of training workers who require credentialed training. It has also made it possible for much manpower money to wind up in the pockets of overnight-

created "training" organizations which offer neither credentialing nor articulation with the educational system. The training that lower level workers receive essentially gets them no further than the immediate applicability to the next job (if it is applicable at all, and if there is a job at all).

Part of our function in offering technical support is giving advice on strategy. We suggest to hospitals that they get out of the business of producing educational services. As purchasers they can combine their efforts and obtain credentialed training in the sequences which they require, and with the elimination of redundant requirements. However, we would be greatly aided by a national commitment to such an approach.

The systems approach to developing job ladders, if it entails the development of curriculum ladders to go with them, would change the focus or context in which Federal manpower policy is formed, and rechannel the flow of program money. Legislation can begin to demand that training be a step on the way to further training and that this be articulated just as job ladders are articulated, and that training be tied to such ladders.

In the course of our work, we designed a nursing sequence which presents a classic example of the kinds of problems facing upgrading programs.[2] The nurse aide - practical nurse - staff nurse ladder is obvious and is not based on our job analysis method. We showed, however, eight

[2] Research Report Number 1, Train Practical Nurses to Become Registered Nurses: A Survey of the PN Point of View.

different kinds of tracks which individuals in the hospital system could follow to go from nurse aide to staff nurse. Some include remediation. Staff nurse requires the RN license and the associate degree level or higher, or a three-year diploma. Among these eight tracks are several which could take the nurse aide to the practical nurse level but which, at the point where she is a practical nurse, has her half-way to the associate degree level in nursing.

It is now impossible to implement such a design through one current piece of legislation, through one government department, or without structural changes in educational institutions and state education departments.

Fragmented Support

The employer has to cover two kinds of costs: payroll costs and education costs. He either must maintain the salaries of trainees studying on a release-time basis and pay for relief workers, or face a reduction in output. He might try to apply for stipends for his trainees so he can pay only for time worked. There are then the costs of paying for the training. Even free public schools will have to finance expansion of plant and faculties because there will be enrollment increases.

At the present time there is no single piece of legislation that will pay these costs on an on-going, regular basis, or help in some interim period. At least four different pieces of legislation, administered in different departments at Federal and State levels would have to be involved.

Legislation and the educational system send us to a separate place for remediation, a separate place for skill training for lower level jobs and a separate place for professional training. There are stipends for hard core unemployed, stipends for people in skill training, but there is no help or money for relief workers or tuition money for employed workers who are going to school on a release-time basis. There is no incentive for the educational institution which would have to expand facilities and faculty in order to accommodate the needs of employed workers in their upgrading sequences.

Thus,it would take an enormous amount of imagination and political pressure to develop the kind of organic programs outlined, ones which essentially cost the least amount of time and effort to implement because they minimize the training time and the relief time necessary to bring people from the entry level to the upper levels. At the moment, I find that the institutions simply do not have personnel with the training, orientation or imagination needed to design funding proposals, to carry out the steps, and do the interlocking planning necessary to implement any kind of upgrading sequence which is built on educationally-based ladders.

TECHNICAL SUPPORT

Having said all this, I think I can move on to the relationship between the kind of technical support which we offer and what we have learned to be the most serious problems we face in the implementation of anything that might be proposed out of the methodology which we are developing.

We offer technical support in the sense that, having designed the methodology, we collect our own data and will be designing job ladders for the institutions that we are studying. As a spin-off of this we will be identifying the curriculum needed to carry people from one job to the next-higher related job, in a sequence of jobs within skill families. The technical support lies in the specific recommendations. We will also offer another kind of technical support. We are and will be training organizations to use our methodology. We expect to continue to be funded in a way which will permit us to train people to go back to their own organizations and apply the method.

We also must offer another kind of technical support, based on the existence of the issues which I have outlined. We have discovered, for example, that, having designed a job ladder, having identified the necessary training steps, we must also help an organization understand the need for institutional changes to make implementation possible. In addition, we have found that it is almost beyond the possible for any institution to come up with people who can put together a package for implementing the kinds of proposals we are suggesting, for the reasons we are suggesting. I would like to see Federal manpower policy change enough to make at least the latter kind of technical support unnecessary.

I suggest to you that fragmented legislation, with emphasis on entry level training rather than emphasis on upgrading sequences, without attention to the real costs of employers, dissuades employers from planning to help themselves. And I suggest to you that there is now no impe-

tus for the educational system to really face up to its responsibilities in training the labor force of this society to operate its technology.

We have essentially abandoned our generation to the effects of miseducation and malplanning in the face of very rapid changes in the composition of manpower requirements. If we do not make a strong turn-around on these issues I suspect that we will be facing more and more serious upper and middle level shortages, and we will not be answering the upward mobility needs of the employed poor or the unemployed.

I urge you to help create legislation which requires that the educational system become a partner in manpower planning and development, to free funding allocations so that manpower programs can accommodate industry's organic needs for upgrading its own labor force through formal educational institutions where this is appropriate or where it is required. I cannot urge too strongly this change of emphasis. This would make it possible for the kind of technical support which we offer to have some meaning and to have some hope for implementation.