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A Study of Research Utilization Processes in British Agriculture.

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This study, done in England and Wales, was a first step in developing a model or set of models for describing processes by which agricultural research findings are put into practice. It was decided that the model should be based on actual instances of transmission and use of research. Models by the author and by others were used in developing descriptive statements. Because of the nature of the source models, three categories (events, process, and decision) were used. Interviews were either narrations of specific instances of the processes under study or less formal interviews in which respondents described policies and general procedures. Data suggested the existence of information efforts activated by both supply and demand; the existence of separate processes was neither proved nor disproved. Supply-activated aspects of research utilization seemed to need better analysis. All narrations are now being flow-charted for study of relationships within the process. Collection of comparable data in other countries is also planned. (Included are appendixes on process and event items, sample item cards, and sample protocols.) (ly)

A Study of Research Utilization Processes in British Agriculture

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One can view an organization as an instrument for accomplishing a task. In the case of many government and voluntary agencies, the task to be accomplished is the application in practice of knowledge gained through research or, to adopt a different point-of-view, to solve problems by use of research results. Efficiency or effectiveness in performing this task is the criterion by which change agencies and organizations are judged.

Application of research knowledge (or the solution of problems) is not achieved in a single step, but in a series of steps which may be viewed as a process. If the process is composed of necessary steps, and if these steps must be performed in a specific sequence, the organization is effective to the degree to which it facilitates the process.

While the overall efficiency and effectiveness remain the best criteria for evaluating past performance, causes for good or bad performance may be found in the correspondence between the organization and procedures of the agency and the process itself. A valid model of the process is, thus, a necessary tool for diagnosing weakness of present organizations and for evaluating the design of new ones.

In recent years it has been recognized that application of research results to practical problems, and the rather rapid adoption of those applications in practice accounted for much of the increase in agricultural productivity in North America and Northern Europe. It has been assumed that organizations like the agricultural advisory services applied to other fields of subject matter, would achieve similar results. This assumption has

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usually not been borne out in practice. Indeed, present forms of agricultural advisory services often do not work well with new problems or new clientele.

One notable example of the need for a valid model is the situation in American education. The federal government is funding efforts to improve educational effectiveness. Many of the activities thus funded involve the application of research-derived knowledge or the adoption of "innovations". Yet efforts to secure research utilization appear to be patterned directly upon other organizations, without attempting to understand the underlying process, or to be based upon untested models of the process itself. Perhaps the most used model on which these efforts are based is the formulation of David Clark and Egon Guba.[1] This classification schema of the elements of the change process has not been tested as a descriptive model, however, nor was it intended by its authors to be one.

Another case in point is that outlined by Professor T. W. Schultz of the University of Chicago[2] in discussing the roles of education and research in the development of Latin America. He cites especially the "extension bias" of development efforts -- the setting-up of advisory services before an adequate knowledge base is available. This defect of approach, if it exists, can be attributed to the transplanting of institutions without full understanding of the process the institution is to carry out. A valid model of research utilization would predict the kinds of research functions needed and the ways those functions should be linked to other elements of the system.

The adoption-diffusion models of the rural sociologists have also been influential. These models have been widely tested by the research and would appear to be useful in this connection. But, on examination, they

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[1]David L. Clark and Egon Guba, An Examination of Potential Change Roles in Education, Bloomington, Ind.: National Institute for the Study of Educational Change (undated). Page 8. An earlier version was reported by Guba in, "From Research into Action", an address before the Educational Research Association of New York State, October 20, 1964.

[2]T. W. Schultz, "Education and Research in Rural Development in Latin America". Office of International Agricultural Development, New York State College of Agriculture, Ithaca, New York, December, 1965.

prove to have shortcomings when applied to the task of designing change agencies. The adoption-diffusion models[1] posit five stages of adoption -- awareness, interest, trial, evaluation, and adoption. These terms can undoubtedly be used to describe the state of a respondent with respect to a practice at a given time. They may even serve as a rough description of the process an individual goes through in adopting a practice. They offer no information, however, about the genesis and evolution of the practice or information being transmitted or about the processes of its transmission (beyond assuming leadership and emulation among the target population).

This study of research utilization in British agriculture was designed as a first step in developing a model or set of models which would describe the process(es) by which the discoveries of research are transformed into practice.

Method of Attack

It was decided that, for the model to be descriptive, it should be based on descriptions of actual instances of research transmission and utilization. These actual descriptions were to be recorded in the form of situation-free event statements to permit comparison of cases.

The classification schema of Clark and Guba, a tentative formulation of Burton Kreitlow, and two proposed models (Fig. 1-2) developed by the present author[2] were used as the basis for the development of the descriptive statements.

Because of the nature of the source models, not all the items could be phrased as event statements. Instead, three categories -- events, process, and decision -- were used (Appendix I). The statements were assigned identifying numbers and duplicated on cards (Appendix II). Case

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[1] c.f. Everett M. Rogers, Diffusion of Innovations. New York: The Free Press of Glencoe, 1962.

[2] Robert L. Bruce, Supply-and Demand-Activated Extension Systems. Unpublished discussion paper, June, 1966.

descriptions were recorded by selecting appropriate cards and arranging them in sequence. A backup recording on tape was also made of each interview.

Source and Collection of Data

The choice of data sources posed a real problem. What was sought was as wide a variation as feasible in the elements of the process and in actual or perceived relations among them. Further, the full extent of the process, i.e., both research and application in practice needed to be present in any situation studied. A further consideration was the intention to conduct the research eventually on a multi-national basis.

The choice of agriculture as the initial area of study was dictated by the fact that it is one of the few areas of knowledge with a history of efforts deliberately to introduce research into practice or to guide practice by research. The choice of situations in which to look at agricultural extension is limited by the fact that efforts in much of the world have been limited, sporadic, or unsuccessful.

Considering the above points, it was believed that the situations in England, Canada, the United States, Mexico, and Northern Europe would offer a wide-enough range of points-of-view while staying within the bounds of feasibility. England was chosen for the initial phase of the study solely because of the author's presence there during the time the study was being initiated.

Most of the narrated incidents included in the study were contributed by officers of the National Agricultural Advisory Service, a branch of the Ministry of Agriculture serving England and Wales. Additional interviews were conducted with members of university faculties, government research establishments, one private corporation, and with farmers (Table 1).

Interviews were of two types: narrations of specific instances of the processes under study (principally from officers of the N.A.A.S.) and less formal interviews, in which respondents described policies and general procedures (from administrative personnel in the N.A.A.S., research directors, etc.).

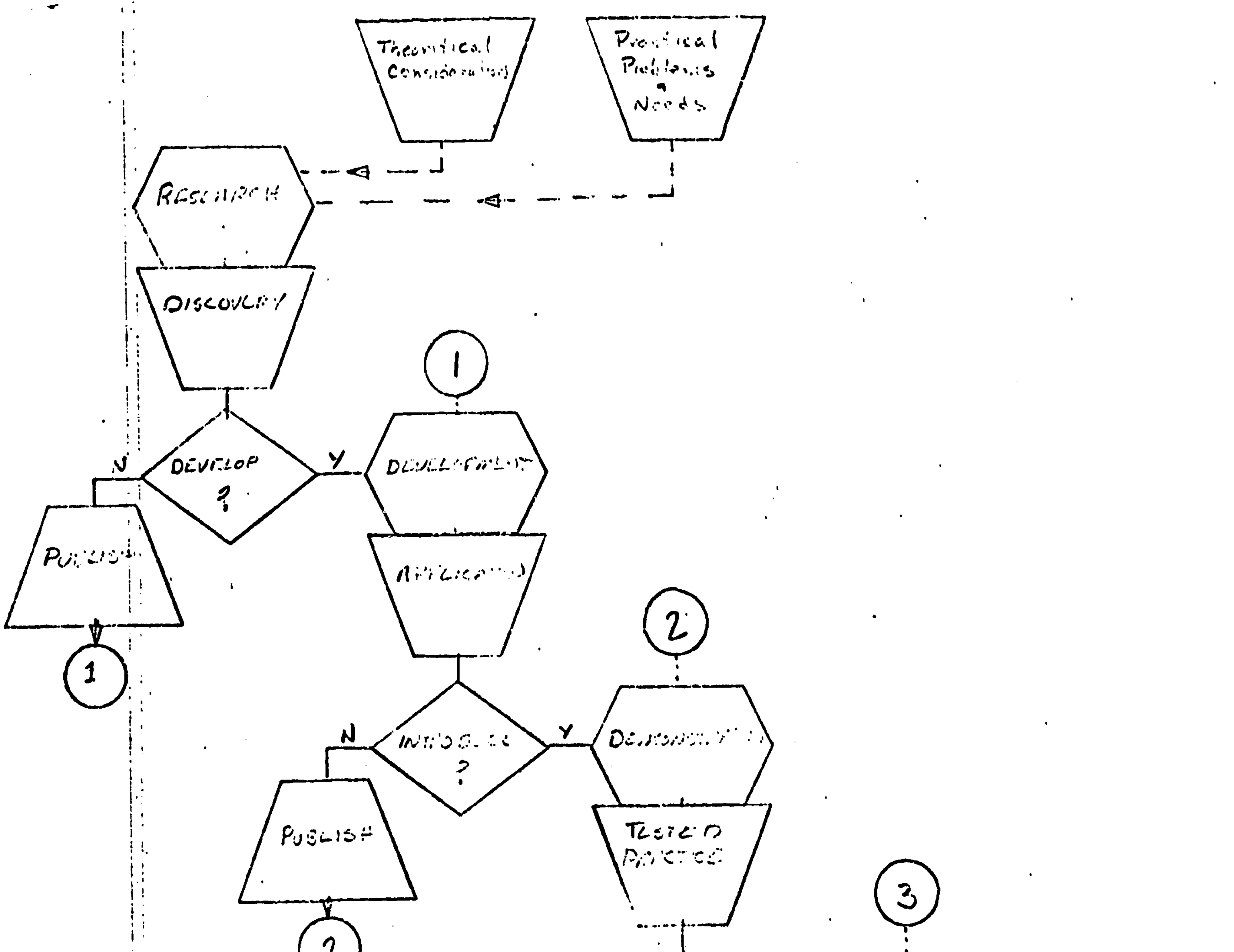


Fig. 1
SUPPLY-ACTIVATED
EXTENSION SYSTEM
4/66

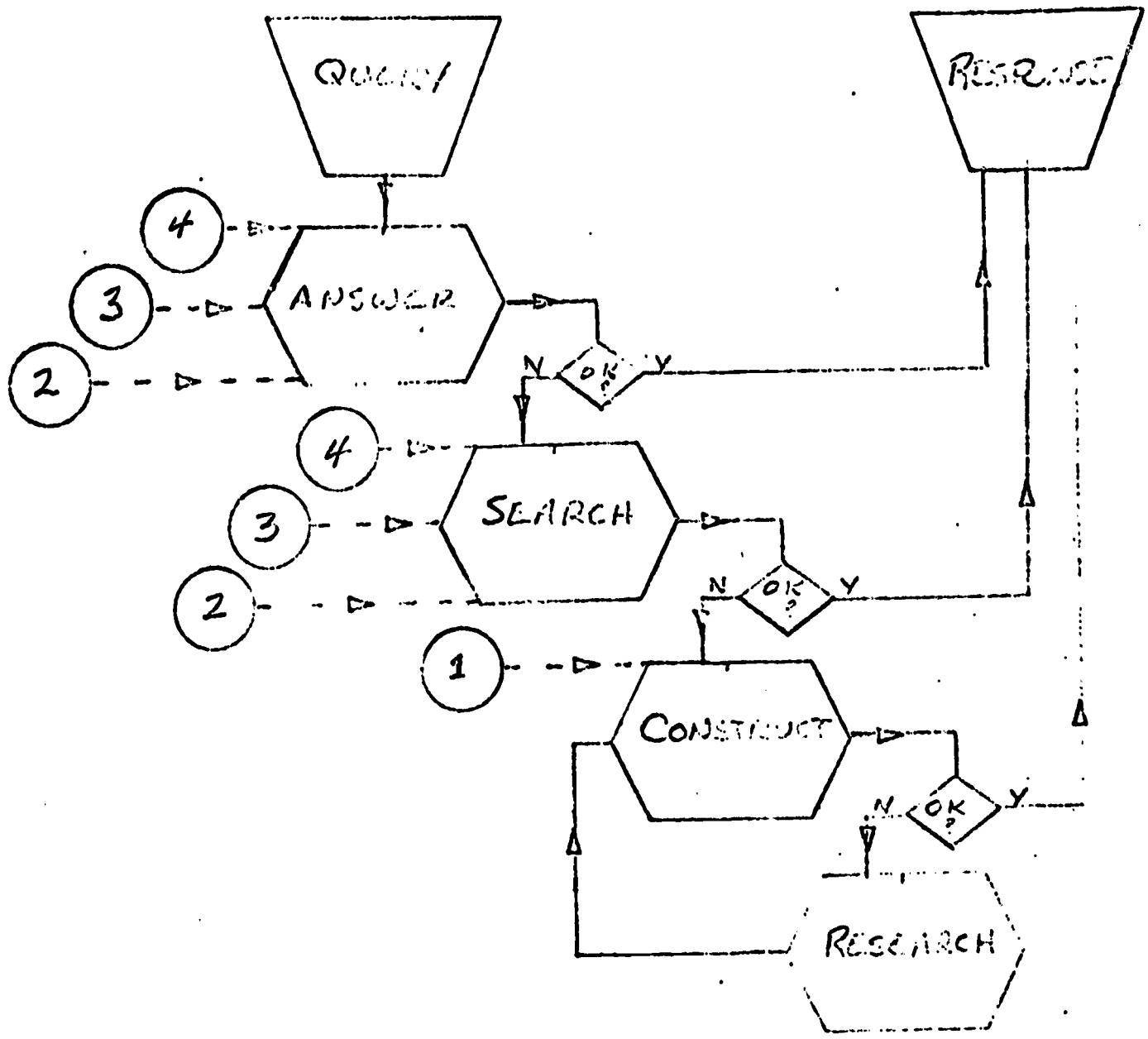


Fig. 2
DEMAND - ACTIVATED
EXTENSION SYSTEM
4/66 R. BRUCE

Interviews were arranged in advance and narrations were secured in the context of a longer informal interview in which the respondent described his work, his problems, etc. Recording -- both by card and by tape -- was completely open and the respondent was informed of the purposes of the study.

Analysis of Data

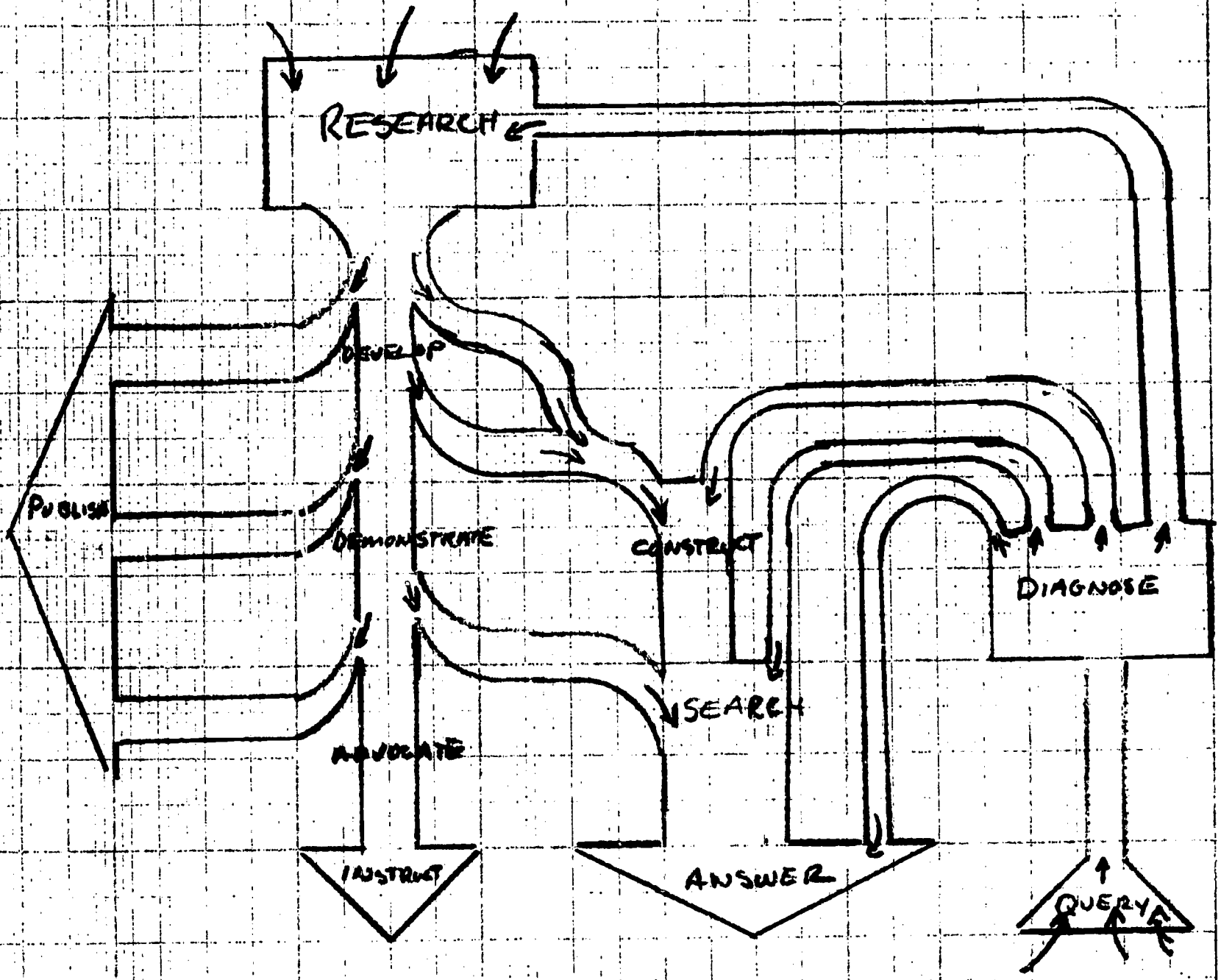
A total of 112 usable narrations was secured from 91 different respondents representing eight counties, four regional headquarters, one research station and one private corporation. Each incident reported was recorded by means of cards as described above, and all but a few were recorded on tape as well.

Analysis of data is still in process at this writing (1 February, 1969). What follows are preliminary indications only.

Table I.

Location and Position of Respondents

Region/County	Regional Specialist	Research Specialist	County Specialist	County or District Specialist	Total
Eastern Region	5				5
Essex			2	4	6
Western Suffolk			3	2	5
Southeast Region	10				10
Hampshire			5	4	9
Kent			5	4	9
Surrey-W. Sussex			5	3	8
Southwest Region	4				4
Cornwall			4	4	8
Wales(Trawscoed)	6				6
Wales(Bangor)	7				7
Pembrokeshire			2	3	5
Montgomeryshire			3	2	5
Rosewarne Horticultural Station		2			2
Imperial Chemical Industries	1	—	—	1	2
Totals	33	2	29	27	91



SUPPLY AND DEMAND ACTUATED
INFORMATION PROCESSES

figure 3

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Limitations

It is important to keep in mind the limitations on any generalizing which might be done at this stage of the study. Even when the analyses are complete, the study will have been conducted in a single country, in a single area of subject matter. Because of the large role played by the N.A.A.S. in the spread of agricultural information in Britain, it is inevitable that some regularities will occur which result from the standard procedures of that agency, rather than from any necessary characteristics of the process being studied. The results of this study may only show possible ways of viewing the process.

For example, exploratory interviews suggested that some process of diagnosis might be present in demand-activated situations, and this was included among the descriptive statements used to record the narrations. This behavior was reported in 66 of the 107 cases reported by N.A.A.S. personnel and was implied in others. It is, in fact, policy that a thorough diagnosis be conducted before advice is given. The study, thus far, suggests the possibility of including diagnosis as a step in the process. If it is found consistently in other countries, the suggestion would be stronger. A final conclusion would have to wait on experimental evidence.

Preliminary Indications

With the above warning firmly in mind, one can say that the present data suggest the existence of both supply and demand-activated information efforts. The existence of separate processes, as originally postulated, was neither proven nor disproven. Certainly, both purposes are present in many of the cases described, and the processes, if discrete, certainly interact. The information flow depicted in Figure 3, seems to be consistent with the bulk of the reports.

A model which would describe these data would be somewhat more complex than any of those mentioned. Decisions, for example, are not taken in the simple form suggested by the earlier Bruce models. There are loops in which new possible answers are generated until an acceptable one is found.

In at least some instances, the decision to construct an answer was made immediately, etc.

The diagnosis step referred to earlier sometimes goes beyond the clarification of the problem, and seems to include determination of how "deep" into the advisory process to go.

The supply-activated aspects of the process are in need of better analysis than they have been given. The N.A.A.S. is demand oriented as an organization, and the narratives reflect this orientation. The things described in Figure 1. and in the Clark-Guba schema appear to be present but it has been difficult thus far to fit them to a consistent pattern.

Future Prospects

Analysis so far has been based largely on the interview protocols (Appendix III). All narrations are now being flow-charted, using the tape-recorded narration as a reference along with the protocols (Appendix IV). This is expected to yield insight into relationships within the process. Plans are also underway for collecting comparable data in other countries.

Appendix I.

Research Utilization
Process & Event Items

Event Items

Ident. No.	Event	Criterion
E. 1.0	Query	Query received
E. 1.1	Input	
E. 1.2	Reference	
E. 2.0	Problem formulated	Both parties satisfied that problem is correctly put.
E. 3.0	Possible answer	Answer to query seems worth pursuing.
E. 4.0	Acceptable answer	Answer accepted by answerer as adequate.
E. 5.0	Installation	Answer has been accepted and applied or advocated practice has been installed.
E. 6.0	Reception	Answer has been received and noted or advocated practice considered.
E. 7.0	Discovery available	Awareness that basic information of value has been discovered.
E. 8.0	Application available	Aware that a possible problem solution is available.
E. 9.0	Practice available	Awareness that a tested practice is available.
E. 10.0	Publishing decision	Decision not to extend further - includes negatives.
E. 11.0	Institutionalization	Advocated practice or answer fully incorporated into system.
E. 12.0	Information available	Awareness of data on subject.

Process Items

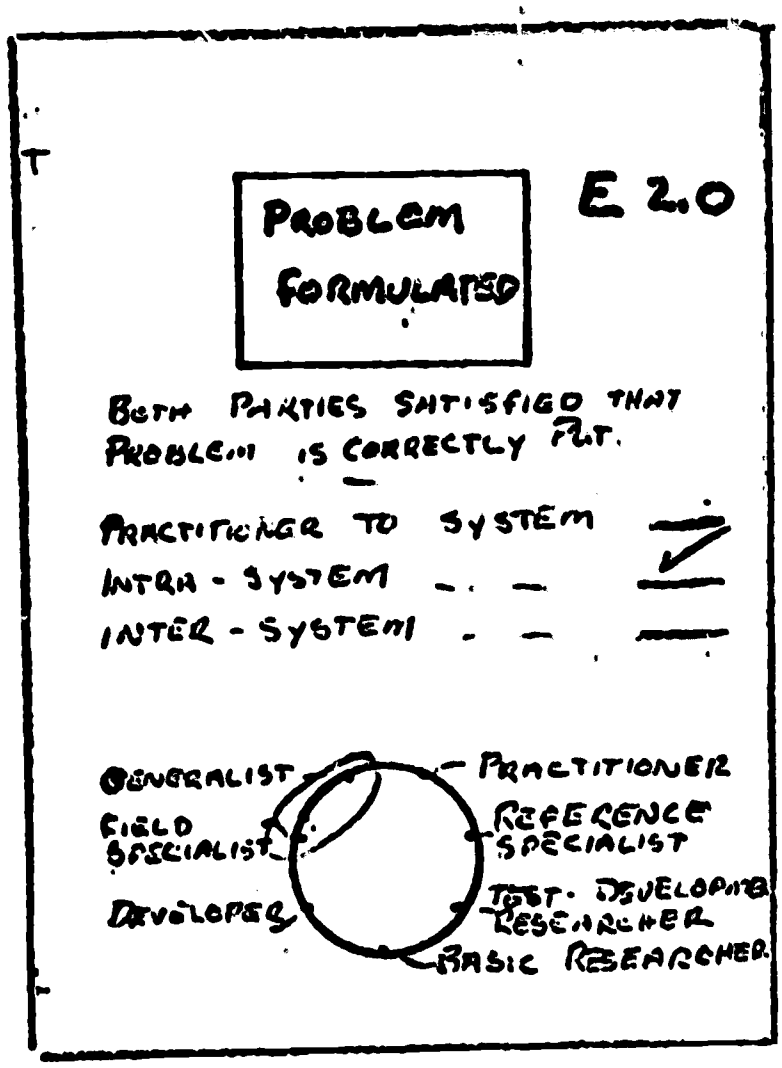
Ident. No.	Process	Additional Information
P. 1.0	Problem seeking	Looking for: Problems of industry Problems of client Instances of problem
P. 2.0	Diagnosis & Confirmation	
P. 3.0	Search	Location
P. 4.0	Construct	
P. 5.0	Research	Motivation
P. 6.0	Development	Motivation
P. 7.0	Demonstration	Motivation
P. 8.0	Advocacy	Motivation
P. 9.0	Instruction	Motivation
P. 10.0	Publication	Content

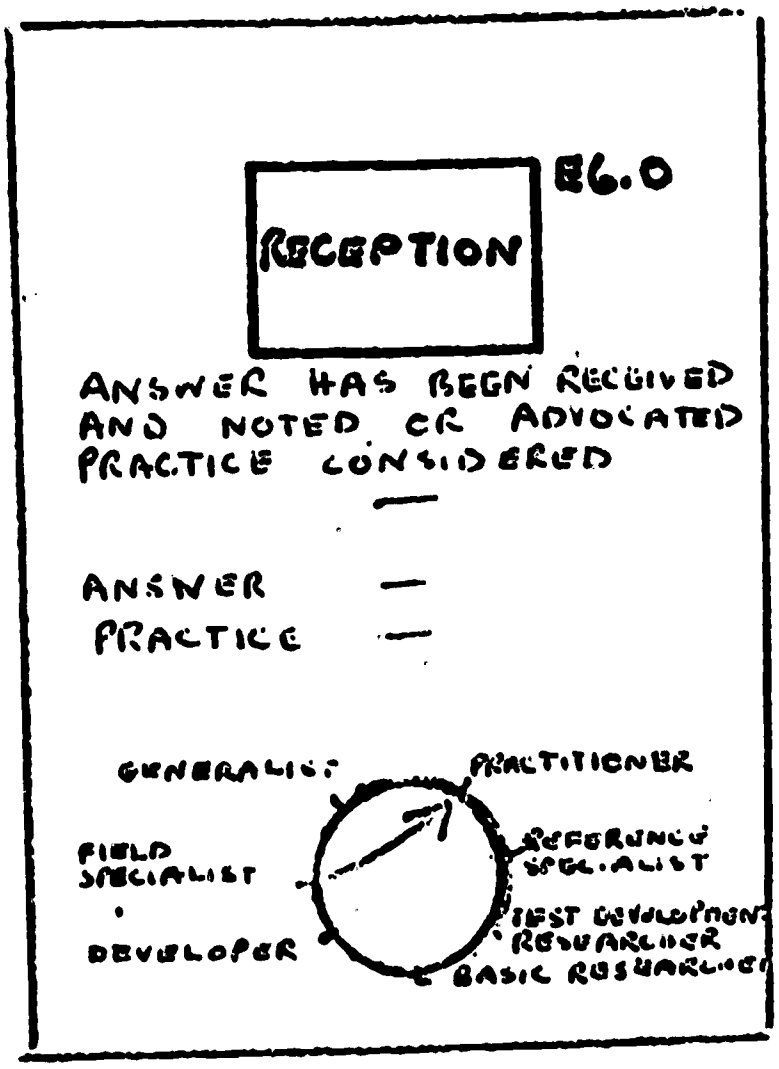
Decision Items

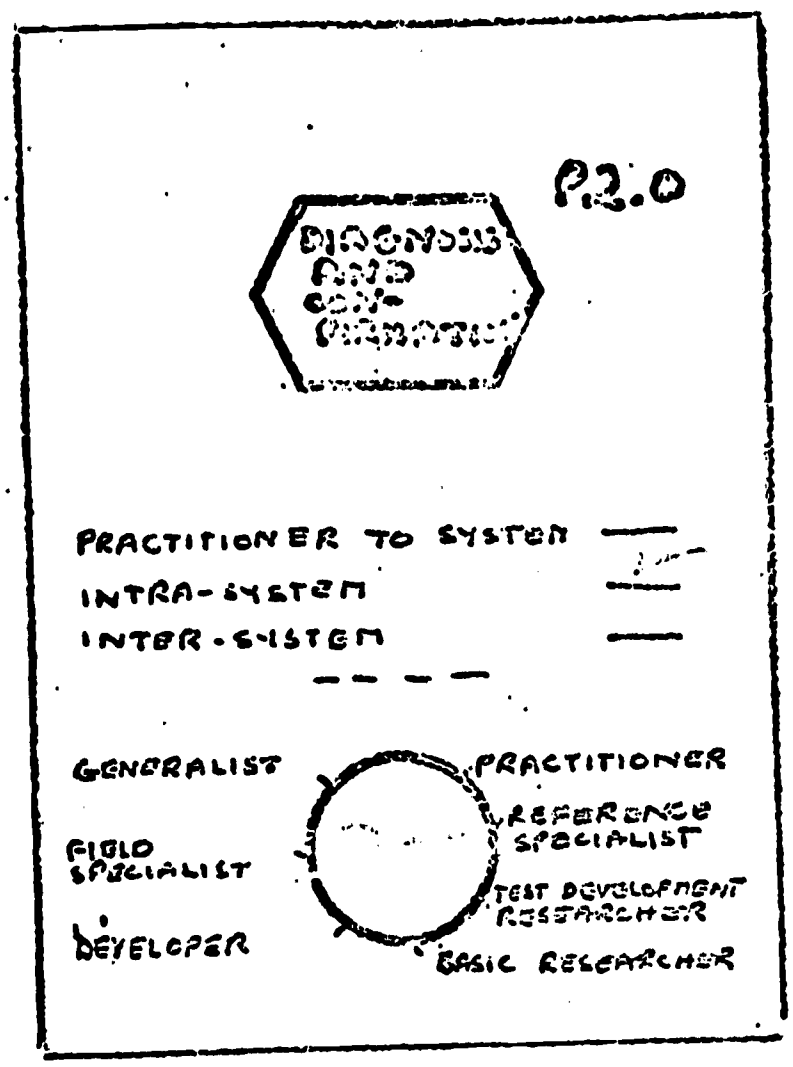
Ident. No.	Decision
D. 1.0	Answer o.k. ?
D. 2.0	Publish?

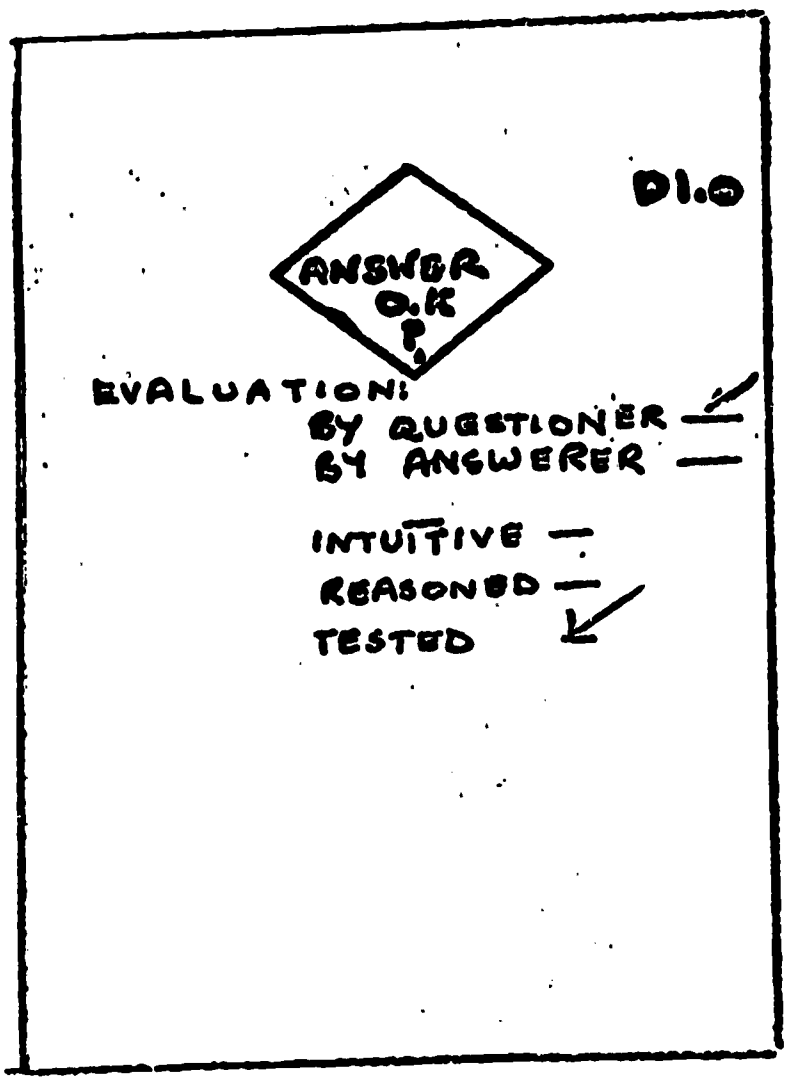
Appendix II.

Sample Item Cards Used in Recording Narrations









FIVE SAMPLE PROTOCOLS

Note the correspondence among these cases, despite minor variations and repetitions. All were described by generalists or county specialists.

Identification Number				
8.27	8.120	7.13	5.15	2.25
		P1		
E 1.1	E 1.1		E1.1	E1.1
P2	P2	P2	P2	P2
E2	E2	E2	E2	E2
	E1.2 P2			
E9/P3	P4		P3	P4
E3	E4	E3		E3
		E1.2		
D.1		D1		
E9/P3				
E3				
D1				
	E1.2			
E9/P3	P4			
E3				
D1				
E4	E4		E4 P8	E4
E6			E6	E6
E5			D1	
D1			E5	E5

SAMPLE

I/D _____

INTERVIEW PROTOCOL
New York State Project 621
RESEARCH UTILIZATION PROCESS
Cornell University

Name [illegible]

Title NUTRITION CHEMIST

Organization N.A.A.S.

~~State~~

~~County~~

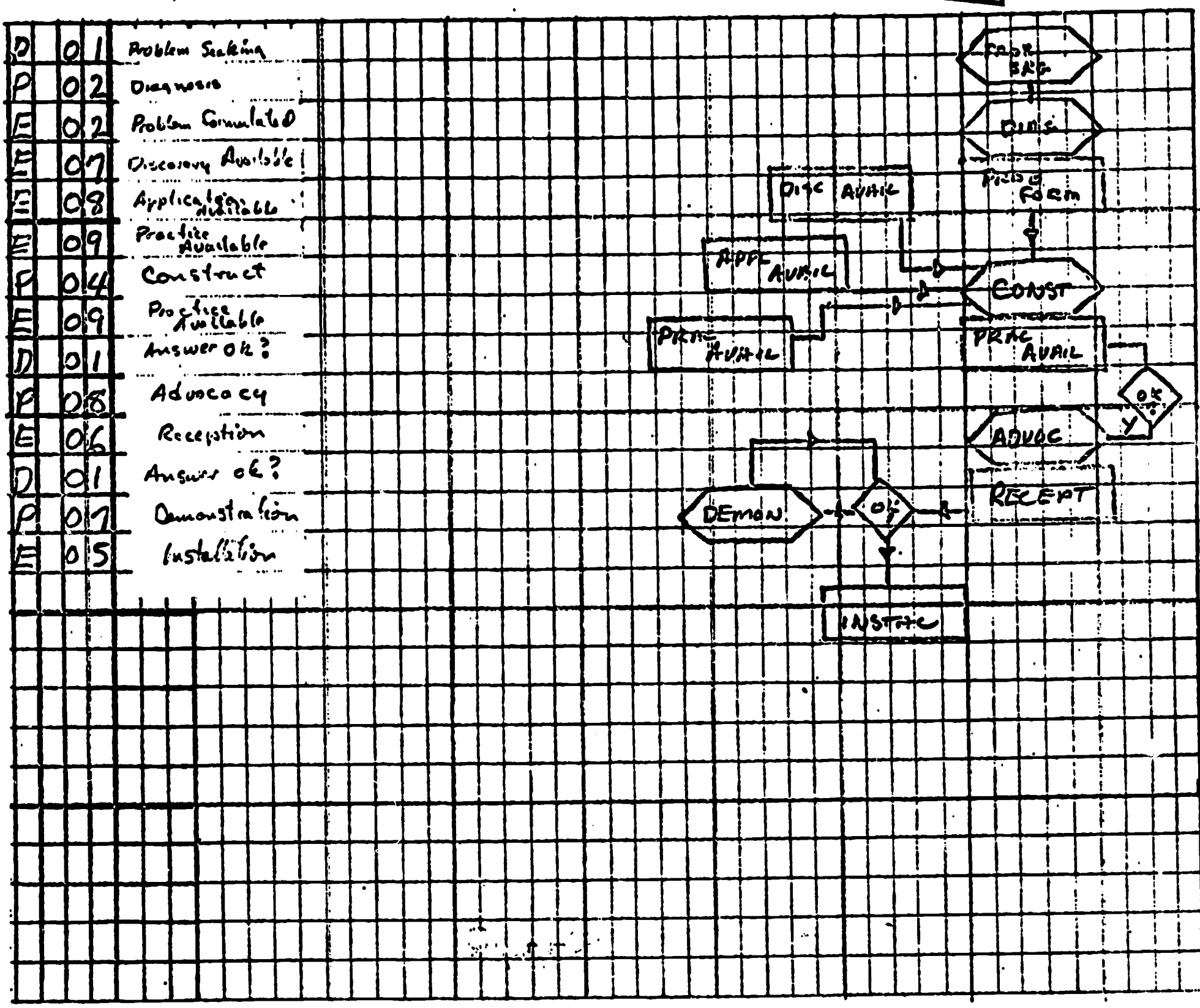
Region WALES (BANGOR)

Country ENGLAND / WALES

Interviewer BRUCE

Tape No. 7.18

D	01	Problem Seeking
P	02	Diagnosis
E	02	Problem Formulated
E	07	Discovery Available
E	08	Application Available
E	09	Practice Available
P	04	Construct
E	09	Practice Available
D	01	Answer ok?
P	06	Advocacy
E	06	Reception
D	01	Answer ok?
P	07	Demonstration
E	05	Installation



Appendix IV.