

CONFIDENTIAL

THE STIRLING COUNTY STUDY

A RESEARCH PROGRAM

IN

SOCIAL FACTORS RELATED TO PSYCHIATRIC HEALTH

FOURTH ANNUAL REPORT

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by

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Alexander H. Leighton, M.D.

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FOREWORD

It is perhaps not necessary to remind the reader that this report is CONFIDENTIAL. At the risk, however, of painting the lily, we would like to stress the danger to ongoing research and to the community under study of any leakage of information on substantive findings or of any information which would identify the community. We refer particularly to the findings in such papers as those on Epidemiology, by Dorothea C. Leighton and on Sentiments by Charles Hughes et al. Such safeguards, of course, do not apply to mathematical and technical matters such as are discussed in the paper by Garnet E. McCreary on the Discriminant Function.

... ..

PREFACE

The Third Annual Report¹, the predecessor of this statement, consisted of a recapitulation of the Stirling Project with emphasis on research design and analytic methods. In the year since, the work has gone along for the most part, according to the general plan then presented and it seems appropriate, therefore, in the interests of avoiding repetition, to make this account a progress report with emphasis on those research findings which are now sufficiently developed to permit inclusion.

In accordance with these considerations, the Fourth Annual Report is divided into two parts, both of which assume acquaintance with the content of the Third Annual Report. Part I follows the former in general order of presentation and brings each topic up to date. There is one additional topic considered and there are several changes in topic titles. Part II presents five articles dealing with results, three being concerned with research instruments of possible value in the general field of preventive psychiatry and two with substantive findings.

1. Leighton, A.H., M.D. The Stirling County Study. A Research Program in Social Factors Related to Psychiatric Health. Third Annual Report. June 30th, 1953. Limer.

THE STILLING COUNTY STUDY

FOURTH ANNUAL REPORT

PART I

Progress Report

1. Staff Changes:²

a. Psychiatric Unit:

Bernard Hebert, formerly at the University of Montreal, has joined the staff as a psychologist. Janice Ross, a graduate of Acadia University and diplomate in Child Study of the University of Toronto, with special training in education and remedial reading, has replaced George Roper as social worker. William D. Longaker, who received training in psychiatry at the University of Pennsylvania and at Cornell University, has taken the place of Charles Dumas as associate psychiatrist. Jean Vernon has become administrative assistant in place of Audrey

2. Ibid, page 2, and for staff changes in progress on June 30th, 1953, see page 4.

keeper. The position of Libuse Tyhurst who returned to Montreal after three years with the Unit, has not been filled.

b. Statistical Unit:

Richard Schwartz, a graduate student in statistics, joined the project as a part-time research assistant.

2. Theory and Operational Plans³

An article outlining the theoretical frame of reference of the study has been prepared and submitted for publication. In addition, a first draft has been made of a more detailed, book-length statement.

3. Study of the Social Environment

a. General Descriptive Study of Stirling County⁴

Although there has been no major attempt in the past year to develop further the descriptive study, a number of field observations have been added. Chief among these is an historical and sociological account of the Bristol General Hospital by Norman Chance.

b. Sociological characteristics important in Mental Health⁵

Preliminary descriptive materials have been assembled on 13 of the 14 variables. This has involved a good deal of re-writing and reassessment and much remains to be done before final

3. Ibid, page 6.

4. Ibid, page 7.

5. Ibid, pages 10 and 14.

reports will be ready.

Statistical treatment has also been applied to seven of the variables, with three (poverty-affluence, acculturation and secularization) worked up in considerable detail. Altogether 25 indices and four Guttman type scales have been applied to 22 strata. The Guttman scales are concerned with level of living, degree of acculturation, religious participation, and intensity of religious feeling. The first of these, level of living (economic) is presented on pages 98 to 111 in Part II of this report.

In the case of poverty-affluence, both qualitative and quantitative data have been brought together and a first draft of a statement on this variable has been written.

c. Intensive Study of Selected Areas⁶

The previously prepared "models" of focus areas have been revised and two more added, making a total of six completed. A seventh (Fairhaven) is currently in process.

One of the completed models consists in a doctoral dissertation by K. A. Tremblay on the bicultural town of Fortsmouth, a focus area added since last year. In this report, problems of French - English acculturation are stressed.

In addition to these accounts of focus areas, two other related statements have been written. One is a description of

6. Ibid, page 13.

the sentiments and values relevant to mental health which have been found characteristic of highly disorganized groups as seen in Stirling County. This report appears on pages 112-150 in Part II.

The second is a doctoral dissertation by Seymour Perker regarding the social and psychological basis of apathy among underprivileged workers. To a large extent, the population concerned is similar to, or identical with, that treated in the report on sentiments and values. Thus it may be said that both reports concern populations which, from a theoretical point of view, have a high potential for psychiatric disorder.

Inasmuch as economic factors appear to have a significant relationship to social organization and to mental health,⁷ some thought has been given to more adequate exploration of economic factors and of remedial possibilities. In line with this, J. K. Galbraith, chairman of the Department of Economics at Harvard, was invited to visit Stirling County and advise us regarding what might be done. As a result, a research project concerning the optimal patterns of land utilization was developed

7. In so far as our own research is concerned, any connection between poverty and mental health must be regarded as still largely speculative, even if plausible. However, we are also influenced by such work as that of Faris and Dunham (Faris, R. L. and Dunham, W.H., Mental Disorders in Urban Areas. Chicago: University of Chicago Press, 1929.) and of Hollingshead and Redlich (Hollingshead A.B. and Redlich, F.C. "Social Stratification and Psychiatric Disorders". Am. Sociol. Rev., 1953, XVIII, 3, pp. 163-169; and Hollingshead A. B. and Redlich F.C. "Social Stratification and Schizophrenia". Am. Sociol. Rev., 1954, XIX, 3, pp. 302-306.) in which socio-economic status is found to have significant relationships to number of persons under treatment for psychological disorder.

and is currently in progress. It is being conducted by L. A. Jenkins, under the joint sponsorship of the Nova Scotia Department of Agriculture and Marketing, and the Department of Economics at Harvard, with our Stirling County group participating in an advisory capacity.

4. Study of the Distribution of Psychiatric Symptoms

a. Case Finding by means of a Total Count⁸

As noted in last year's report, except for completing activities already in process, further work of this sort has been deferred. The completing of activities already in process was carried out and consisted in finishing the census (by means of key informants) for the entire county.

b. Case Finding by means of a Survey Questionnaire⁹

The monograph regarding the development of a survey instrument (the Health Opinion Survey) using discriminant function analysis, is completed, having been accepted as Allister Macmillan's doctoral dissertation. Publication is now being considered and a short report on the findings is presented on pages 16 to 72 in Part II of this paper.

Since discriminant function analysis is a procedure which is extremely time consuming and since it is likely to play a major part not only in the Stirling County Study, but also in other similar types of epidemiological work, considerable effort has been

8. Leighton, A. H. op.cit., page 20.

9. Ibid., page 24.

devoted to a search for approximate methods that would be both quicker and sufficiently usable. Eight different discriminant function methods have been compared and the results are now being made ready for publication. A condensed version is given on pages 73 to 97 in part II of this report.

Some additional work on latent dichotomics¹⁰ has been carried out with the result that twenty-one have now been found. Certain of these have been combined to form two latent super-structures, but more work will be required in order to investigate their meaning and validity.

The immediate task that lies ahead is the recalibration of the I.C.S. in terms of two populations now available, psychoneurotics and persons probably free of symptoms.¹¹ Considerable advance has been made in devising procedures and carrying out preliminary work but the task has not yet been brought to completion.

c. Case-Finding on a Sampling Basis¹²

All the data necessary for analysing the approximately 20% sample of the Bristol town area have been gathered. In addition, a start has been made on interviewing physicians on the total Stirling County sample (1,015 individuals) and on checking these names against the records of a general hospital in a neighbouring county. The latter is the only relevant medical institution in the Province whose records were not searched in the course of the earlier case-finding operation.

10. Ibid, page 27.

11. Ibid, page 29.

12. Ibid, page 29.

d. Epidemiological analysis¹³

Each individual in the 20% sample of Bristol town area has been evaluated according to the method evolved during the previous year. The results of this have been tabulated and a general picture of the prevalence and patterning of psychiatric symptoms has been obtained. A first article on the topic is ready for publication and appears on pages 151 to 175 in Part II of this report.

5. Correlations between Social Environment and Psychiatric Symptoms¹⁴

The completion of the psychiatric evaluation of the Bristol town area puts us in position, for the first time, where we are equipped to begin to examine relationships between social-environmental conditions and the prevalence of symptoms. However, this type of analysis is in a very early phase with the result that, except for a few items mentioned in the article in Part II (pages 151-175), reporting must wait for its more adequate development.

6. Case Studies¹⁵

Notable progress has been made in this regard during the course of the past year. Two psychiatrists, Cleveland and Longaker, using current material available in the Clinic, have been developing a theoretical framework by means of which the interplay between social factors and psychiatric disorder can

13. Ibid, page 33.

14. Ibid, page 35.

15. Ibid, page 39.

be more adequately understood as a dynamic process. Contributions to this work have also been made by the psychologists, Vernon and Hebert, and by the social worker, Ross. Projective tests, particularly the Rorschach, have been utilized in the development of this line of thinking.

7. Operational Study of a Rural Psychiatric Clinic¹⁶

Dr. J. S. Tyhurst has prepared an article entitled "Observations on the Family in Relation to Mental Disorder" which is in fact a report on the first two years of the Clinic's operations. In addition to a series of tables summarizing the quantity and quality of patient load and its relation to Clinic staff activities and relationships with the larger community, it draws implications for diagnosis and treatment with particular emphasis on the family as the unit of treatment. The report "is intended to illustrate the relevance of the family situation in diagnosis and treatment and to explore some ways in which relevance of the family in mental disorder can be conceptualized."

This report is at present undergoing expansion and revision and will appear in printed form at an early date.

New work has been carried out in the past year designed to explore further the potential usefulness of a rural clinic. In addition to the common round of speeches on invitation before various local organizations, a series of open-house evenings has

16. Ibid, page 40.

been held at the Clinic and have been attended by such groups as teachers, Kiwanis Club, Clergy, and municipal and town councillors. On these occasions, the showing of the physical arrangements of the Clinic was taken as an opportunity for explaining its functions and for answering questions. At the instigation of the Protestant Clergy a number of one-day institutes have been held, during which problems have been discussed regarding the relationship of psychotherapy and spiritual guidance.

The staff has also given time to advisory work with Mental Health Association Units in two nearby counties. Since one of these is considering the initiation of a psychiatric clinic, we have endeavoured to make available the results of our own experience.

In addition to measures which are preventative in the educational sense, the psychiatric unit has given attention to prevention by means of early treatment. The major step in this direction has been the recent purchase of an E.C.T. machine and the completion of arrangements with the general hospital whereby such therapy can be given in a room set aside for the purpose.

Also, the regular psychotherapeutic and social work services of the Clinic have been maintained, with as much emphasis as possible on early and short rather than long term treatment.

8. Statistical considerations

In the Third annual report the activities of the statistical unit were treated in the course of describing the work of each of the other teams. This is appropriate in view of the fact that the statistical operations are related to the goals of one or another of the other units, and the same procedure as last year has been followed in this report. However, there are a number of general notes regarding the work of the statistical unit that deserve separate mention.

One of these has to do with the Family Life Survey¹⁷ and the difference between the sample estimate using the household as the sampling unit, and the sample estimate using the individual man or woman of the house (the sample was confined to these two categories) as the sampling unit. Since small differences - less than the sampling error - were observed on the stratum scores for the four Guttman¹⁸ scales and since there exist other sources of error of at least equal magnitude, it was decided that there was no need to use the time consuming, although unbiased, estimate based on man of the house or woman of the house.

A similar investigation had to be done on the psychiatric side for the evaluation tables.¹⁹ In this case, the sampling

17. Ibid, page 30.

18. For meaning of a Guttman scale, see page 99 of part II.

19. See part II, page 167 and following.

rates were more complicated because the holding of two types of samples was involved. When the sampling corrections were made, the differences between the more correct estimates and sample estimates were negligible. Also it was found that the easier methods of estimating sample error were sufficiently accurate for the purposes of the study.

A good deal of time was devoted to considering ways and means of relating different levels of analysis, such as individual and community. Some thought had been given to the appropriateness of covariance analysis and Fisherian factorial analysis in this type of study. Much work remains to be done in the way of analysing interrelationships between the 14 variables, between items, and between items and variables. It is expected that this will lead into some aspects of multivariate analysis and complex pattern analysis.

9. Future Plans²⁰

The future plans remain substantially as outlined in the Third Annual Report but a number of developments may be noted.

With reference to Section 3, above, of this report, an additional focus area, Portsmouth, has been selected and described.

In connection with Section 6, a plan for research operations using psychological tests, has been developed by Vernon and is now undergoing revision. It is hoped that when this is

20. Leighton, A.H. Op.cit., page 40

put into effect we shall be able to go to a greater psychological depth than has been achieved by the methods used thus far. The expectation is that after identifying people as having symptoms or being free of symptoms, we shall be able to get at some of the underlying factors that distinguish these two groups and hence progress toward dynamic rather than purely symptomatic criteria.

PART II

Preliminary Research Findings

Introduction

The following five articles have been chosen primarily in terms of convenience. They are short, as compared to the doctoral dissertations or the statement of theory, and yet, although still in a preliminary form, they are relatively complete.

It is hoped that each has some intrinsic interest in itself. This is said in the light of the fact that the Stirling County Study has a total architecture and that each unit of work is visualized as contributing primarily to a total result. Thus it may be expected that the full meaning of the parts, whatever it may be, cannot be discovered until the whole is assembled and integrated. Nevertheless, it has been our practice to divide the work into units which to the maximum extent possible, have something to offer in their own right. In this sense, these reports are units in themselves,

but from a longer view, they are partial as well as preliminary.

The first three reports deal with instruments of investigation which have been devised or developed in order to progress toward solution of the research problems. It is thought that they may have general interest of at least two kinds. On the one hand, they might be useful in the conduct of other research, especially in the field of psychiatric epidemiology. On the other hand, it is hoped they also have potential usefulness in practical and immediate types of investigation.

The first of these articles reports the development of a survey instrument with which an investigator can rapidly estimate the proportion of persons in a community who are in need of psychiatric services. Such an instrument can of course be used in many ways. For example, the size and cost of new facilities can be based on an adequate estimate of need; or the effectiveness of some form of treatment over a period of time can be ascertained.

The second article, it is hoped, will be of interest to the epidemiologist and statistician. It compares several forms of a useful statistical method to determine how they differ in those characteristics which are the basis for selecting one rather than another for a particular task.

It has long been hypothesized that poverty is significantly related to health, mental and physical. Poverty has often been measured in monetary terms. However, it is well known that monetary units, per se, are not adequate units for measuring poverty and affluence. Other units have been tried but none have so far proved

completely adequate. The third paper presents the application of a recently developed method, the Guttman scaling technique, to the poverty-affluence variable. There are certain limits to the generalized applicability of a Guttman scale to populations other than that for which it was developed. However, we feel that this scale has some value as a quick method of assessing the level of economic well-being in various populations.

The fourth and fifth papers report substantive findings. The fourth portrays the patterns of belief, attitude and sentiment which motivate the people living in certain isolated areas and points up how these sentiments arose from certain socio-historical conditions. It is supposed that these sentiments have at least a dispositional relationship to psychopathology.

The fifth report presents the results of an attempt at assessing the prevalence of mental illness in a population. By sampling the total adult population rather than institutional records, it arrives at a probability estimate of the amount of psychopathology in a community.

The last two reports deal with findings about conditions in Stirling County. As such, they do not warrant generalization to other areas. However, since it is the opinion of the research workers that the conditions in Stirling are not unique, it is probable that the findings are characteristic of other areas and other populations. The degree to which this is true, however, remains to be established by further research.

A Survey Technique for Estimating the Prevalence
of Psychoneurotic and Related Types of Disorder

by

Allister M. Macmillan¹

Introduction

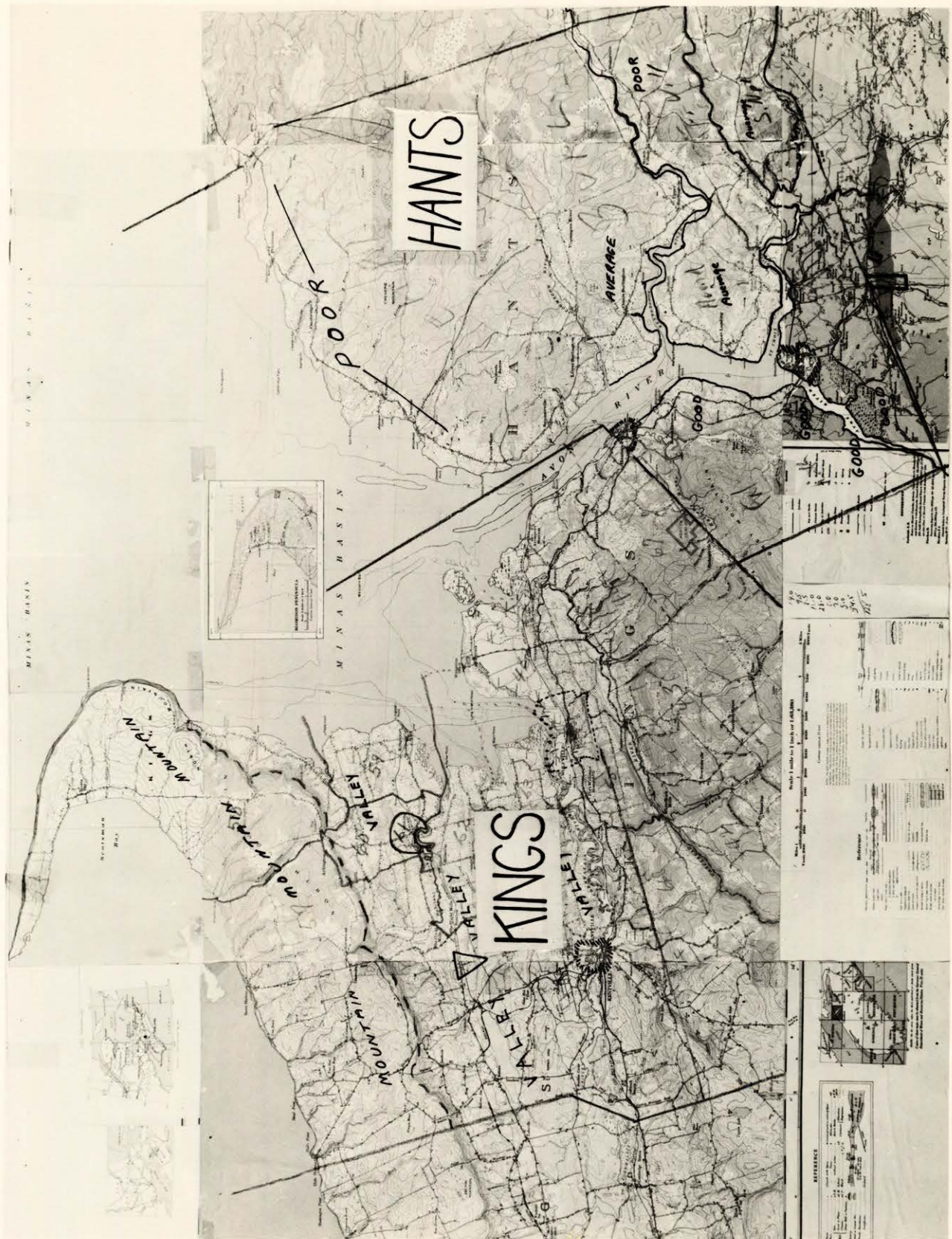
A review of the genesis of the Mental Health Survey unit's major research task has been presented in a previous report². This paper will therefore be confined to reporting results of certain early phases of the analytic process in developing a screening instrument from the Health Opinion Survey (HOS). The HOS consisted of 75 health-oriented questions³ which were answered by 559 white community adults, aged 20-59 years, in Hants and Kings counties⁴ and by 75 adults in nearby hospitals who had been psychiatrically

1. The writer wishes to express his appreciation for assistance given at varying stages in this work of: Cornell psychiatrists - Temple Burling, John Butler, Douglas Darling, Alexander H. Leighton, Dorothea C. Leighton, James S. Tyhurst, and William D. Longaker; Clyde C. Marshall, Neuropsychiatric Division, Nova Scotia Department of Health; Robert O. Jones, J. Fraser Nicholson and Robert J. Weil of the Department of Psychiatry of Dalhousie University; Edward A. Suchman of the Department of Sociology and Anthropology, Cornell; Garnet E. McCreary, Stirling Statistician; and Miss Jessie Cohen of the Cornell Social Science Research Center.

2. Leighton, *op. cit.*, Third Annual Report, pp. 24-29.

3. The HOS Interview Schedule is reproduced in full at end of article.

4. See map of HOS sampling area, facing page 17.



diagnosed as being psychoneurotic or having "character disorder". The principal task was to ascertain whether the responses of community group adults to these questions would be significantly different from the responses of the hospitalized group.

The HCS test was built around 15 items of the Army Neuropsychiatric Screening Adjunct⁵ (NSA) used in the Army screening program. Although composed of "psychosomatic" items, NSA had appeared to have a wider use in being able to select individuals with general psychoneurotic and other "nervous" symptomatology⁶. When the data had been subjected to Guttman scale analysis⁷, it had formed a quasi-scale sufficiently valid for use in the practical screening situation.

Preliminary Examination of Data

The Army findings led us to examine our community marginals on these 15 NSA items for the possibility that they would form a quasi-scale for our community population. We realized, however, that the community testing situation and the Army situation were very different, and, even though we might find a similarity, we could not assume an identical unidimensional factor in both groups.

The responses of the Hants county random sample (300 whites) were compared with those of the Army cross-section in our preliminary analysis. Table 1 on the next page shows this comparison.

5. Stouffer et al., Studies in Social Psychology in World War II
Volume IV, "Measurement and Prediction", Princeton, 1950.

6. For example, Clark, J. H., "The Adjustment of Army A.C.I.S.",
J. abnorm. soc. Psychol., 1949, Vol. 44, pp. 394-401, found that
"psychopaths" and others tended to have high neurotic scores in a
similar type of neurotic inventory.

7. For more detailed mention of Guttman Scales, see p. 99 this report.

Table 1
Hants Community Adults - Army Cross-section

| HCS Item (HSA) | Answer Categories | Hants 300 % | Army Cross- section % |
|-------------------|--|----------------|--------------------------|
| Q 14 | Do you have any particular physical or health problem? | | |
| | Yes | 36 | 35 |
| | Undecided | 5 | 6 |
| Q 15 | Do you often have trouble in getting to sleep or staying asleep? | No | 59 |
| | | Often | 7 |
| | | Sometimes | 33 |
| Q 16 | Do your hands ever tremble enough to bother you? | Almost- | 60 |
| | | Never | 7 |
| | | Sometimes | 13 |
| Q 17 | Have you ever had any fainting spells? | Never | 85 |
| | | Several | 5 |
| | | A few times | 19 |
| Q 18 | Are you ever bothered by nervousness? | Never | 76 |
| | | Often | 11 |
| | | Sometimes | 51 |
| Q 19 | Have you ever been bothered by your heart beating hard? | Never | 38 |
| | | Often | 7 |
| | | A few times | 34 |
| Q 20 | Have you ever been bothered by pressures or pains in the head? | Never | 59 |
| | | Often | 9 |
| | | Sometimes | 36 |
| Q 21 | Have you ever had spells of dizziness? | Never | 55 |
| | | Often | 7 |
| | | A few | 43 |
| Q 22 | Do you ever bite your fingernails now? | Never | 50 |
| | | Often | 7 |
| | | Sometimes | 10 |

Table 1 (continued)

| HOQ Item (NSA) | Answer Categories | Navts 300 % | Army Cross- section % | |
|-------------------|--|------------------------|--------------------------|----|
| Q 23 | Have you ever been bothered by short- ness of breath when you were not exercis- ing or working hard? | Often | 5 | 12 |
| | | Sometimes | 25 | 31 |
| | | Never | 70 | 57 |
| Q 24 | Are you ever troubled by your hands sweat- ing so that they feel damp and clammy? | Often | 10 | 18 |
| | | Sometimes | 39 | 43 |
| | | Never | 51 | 39 |
| Q 25 | Are you ever troubled with sick headaches? | Often | 5 | 10 |
| | | Sometimes | 40 | 38 |
| | | Never | 55 | 52 |
| Q 26 | How often are you bothered by having an upset stomach? | Nearly all the time | 1 | 4 |
| | | Fretty often | 7 | 15 |
| | | Not very often | 67 | 59 |
| | | Never | 25 | 22 |
| Q 27 | Are you ever bothered by having nightmares (dreams that frighten or upset you very much)? | Many times | 3 | 4 |
| | | A few times | 25 | 32 |
| | | Never | 72 | 64 |
| Q 28 | Have you ever been troubled by cold sweats? | Often | 1 | 5 |
| | | A few times | 18 | 37 |
| | | Never | 81 | 58 |

The answers of these two groups indicate clearly a general similarity of response patterns in spite of differences in the composition of the groups and in the way the data was gathered. These differences were that the Army group was relatively homogeneous, consisting of young males, and it answered a pencil and paper test; while the Hants group was heterogeneous, aged 20 to 55 years and of both sexes, and answered questions in a personal interview situation.

If a similar result could be obtained in a comparison of our diagnosed psychoneurotic population with the Army psychoneurotics, we felt we would be justified in searching for Guttman scales. Table 2 on the following two pages gives this comparison⁸.

8. Data on Army psychoneurotics from Stauffer et al., op. cit., pp. 535-538.

Table 2
HOS Hospital Inⁿ Group - Army Neurotics

| HOS Item (NSA) | Answer Categories | HOS 75 | | Army | |
|--------------------------|----------------------|--------|---|------|---|
| | | Fn | % | Fn | % |
| Q 14 Health Problems? | Yes | 62 | | 58 | |
| | Undecided | 18 | | 18 | |
| | No | 20 | | 24 | |
| Q 15 Trouble Sleep? | Often | 37 | | 52 | |
| | Sometimes | 45 | | 34 | |
| | Almost Never | 14 | | 14 | |
| Q 16 Hands Tremble? | Often | 21 | | 22 | |
| | Sometimes | 43 | | 40 | |
| | Never | 36 | | 38 | |
| Q 17 Fainting Spells? | Several | 5 | | 21 | |
| | A few times | 35 | | 41 | |
| | Never | 60 | | 38 | |
| Q 18 Nervousness? | Often | 43 | | 70 | |
| | Sometimes | 48 | | 25 | |
| | Never | 9 | | 5 | |
| Q 19 Heart Beating Hard? | Often | 23 | | 45 | |
| | A few times | 57 | | 41 | |
| | Never | 20 | | 14 | |
| Q 20 Pains in Head? | Often | 13 | | 16 | |
| | Sometimes | 57 | | 37 | |
| | Never | 30 | | 47 | |
| Q 21 Dizziness? | Many times | 23 | | 45 | |
| | A few times | 59 | | 45 | |
| | Never | 18 | | 10 | |

Table 2 (continued)

| HCS Item (NSA) | Answer Categories | HCS 75 Fn % | Army Fn % |
|------------------------|----------------------|----------------|--------------|
| Q 22 Bite Fingernails? | Often | 15 | 23 |
| | Sometimes | 21 | 30 |
| | Never | 64 | 47 |
| Q 23 Shortness Breath? | Often | 20 | 40 |
| | Sometimes | 41 | 41 |
| | Never | 39 | 19 |
| Q 24 Hands Sweating? | Often | 41 | 57 |
| | Sometimes | 35 | 33 |
| | Never | 24 | 10 |
| Q 25 Sick Headaches? | Often | 14 | 42 |
| | Sometimes | 51 | 44 |
| | Never | 35 | 14 |
| Q 26 Upset Stomach? | Nearly all time | 9 | 20 |
| | Fretty often | 32 | 38 |
| | Not very often | 50 | 37 |
| | Never | 9 | 5 |
| Q 27 Nightmares? | Many times | 14 | 31 |
| | A few times | 53 | 49 |
| | Never | 33 | 20 |
| Q 28 Cold Sweats? | Often | 15 | 26 |
| | A few times | 47 | 54 |
| | Never | 38 | 20 |

"Fn designates "Psychoneurotic" in this paper.

The performance of these populations indicates less similarity in response patterns than was found with the earlier groups, but both psychoneurotic groups do show a general tendency to give the extreme "sick" (Often) or the middle responses (Sometimes), in contrast to the community adults and the Army cross-sections, which frequently gave the "well" responses (Never). A tentative conclusion which offered itself here was that the differences in response patterns might have resulted from the previously mentioned heterogeneity of the community and hospital groups in contrast to the rather homogeneous groupings found in the Army.

A third comparison was considered important at this stage of the analysis. It concerned the consistency of response by various groups within the community sample. Were the adults in any particular grouping answering these questions somewhat like other county adults, or was there a wide variation in the patterns of response that would need to be taken into consideration from the beginning? This comparison is shown in Table 3 on pages 24 and 25, where we give the responses of six successive groups of 50 Hants County adults, as well as those of the entire Hants group, on the 15 NSA items which we proposed to submit to Guttman scaling trials.

Table 3

Consistency of Response in Six Successive Groups
of 50 Hants Interviews on 15 USA Items

| HCS Item Number | I (1-50) | II (51-100) | III (101-150) | IV (151-200) | V (201-250) | VI (251-300) | Full Hants (1-300) |
|--------------------|----------------|----------------|------------------|-----------------|----------------|-----------------|-----------------------|
| 14 | 34 8 58 | 32 8 60 | 46 0 54 | 26 6 66 | 30 8 56 | 40 2 58 | 36 5 59 |
| 15 | 4 20 76 | 6 24 70 | 8 32 60 | 10 40 50 | 4 36 60 | 12 46 72 | 7 33 60 |
| 16 | 2 6 92 | 4 10 86 | 4 14 82 | 0 14 86 | 2 22 76 | 0 12 88 | 2 13 85 |
| 17 | 4 18 78 | 2 18 80 | 4 21 76 | 4 32 64 | 8 10 82 | 6 14 80 | 5 19 76 |
| 18 | 10 48 42 | 6 52 42 | 10 56 34 | 8 52 40 | 22 38 40 | 12 58 30 | 11 51 38 |
| 19 | 2 34 64 | 6 24 70 | 2 30 68 | 12 30 58 | 14 30 50 | 6 52 44 | 7 34 59 |
| 20 | 8 22 70 | 14 30 56 | 10 42 48 | 8 38 54 | 6 44 50 | 6 38 56 | 9 36 55 |
| 21 | 6 24 70 | 6 34 60 | 12 44 44 | 0 58 42 | 10 48 42 | 6 48 46 | 7 43 50 |

Table 3 (continued)

| HOS Item Number | I (1-50) | II (51-100) | III (101-150) | IV (151-200) | V (201-250) | VI (251-300) | Full Hants (1-300) |
|--------------------|-------------|----------------|------------------|-----------------|----------------|-----------------|-----------------------|
| 22 | 14 | 6 | 8 | 4 | 8 | 0 | 7 |
| | 18 | 18 | 6 | 6 | 4 | 6 | 10 |
| | 68 | 76 | 86 | 90 | 88 | 94 | 83 |
| 23 | 4 | 0 | 6 | 12 | 8 | 2 | 5 |
| | 16 | 28 | 12 | 28 | 28 | 36 | 25 |
| | 80 | 72 | 82 | 60 | 64 | 62 | 70 |
| 24 | 6 | 6 | 12 | 16 | 10 | 12 | 10 |
| | 48 | 40 | 34 | 26 | 46 | 40 | 39 |
| | 46 | 54 | 54 | 58 | 44 | 46 | 51 |
| 25 | 2 | 4 | 10 | 0 | 12 | 2 | 5 |
| | 36 | 36 | 44 | 40 | 38 | 44 | 40 |
| | 62 | 60 | 46 | 60 | 50 | 54 | 55 |
| 26 | 4 | 2 | 2 | 0 | 0 | 0 | 1 |
| | 4 | 8 | 6 | 6 | 8 | 8 | 7 |
| | 72 | 68 | 80 | 58 | 62 | 64 | 67 |
| | 20 | 22 | 12 | 38 | 30 | 28 | 25 |
| 27 | 2 | 4 | 4 | 0 | 4 | 4 | 3 |
| | 22 | 18 | 22 | 22 | 34 | 32 | 25 |
| | 76 | 78 | 74 | 78 | 62 | 64 | 72 |
| 28 | 0 | 2 | 2 | 2 | 2 | 0 | 1 |
| | 20 | 16 | 16 | 16 | 22 | 18 | 18 |
| | 80 | 82 | 82 | 82 | 76 | 80 | 81 |

An examination of this table indicates a relatively stable pattern of responses, comparing groups of 50, for any particular question. This is not to state, however, that all those groups are relatively homogeneous. In fact, the composition of the community groups is quite "mixed" since interviews from different categories of adults are represented in each 50. For example, Group I is composed of people from "Good farming", "Day labor" and "Urban" areas of the county. In Group IV, one-third are from "Average farming" areas and the balance from "Poor farming" areas of the county⁹.

Guttman Scaling Trials

The technique of constructing Guttman scales need not be elaborated here¹⁰. Briefly, it is essentially an empirical method of rank-ordering individuals by means of the particular pattern of their responses to a number of items which are assumed to be tapping a unidimensional aspect of their subjective processes. Certain mathematical criteria are required for the response patterns to be classed as a "scale" in the Guttman sense. A less rigid set of criteria allows the assumption of a quasi-scale. Guttman has suggested that 10 or more items be used for building a scale.

9. As rated by the county agriculture agents before the sampling.
10. Guttman, Louis, "The Cornell Technique for Scale and Intensity Analysis", Ed. and Psychol. Meas., 1947, Vol. 7, pp. 247-279, and Stouffer et al., op. cit. In addition, for a good review of scaling see Remmers, H. H., Introductions to Opinion and Attitude Measurement, N. Y.: Harper, 1954, Chapter IV, "Scaling Techniques", pp. 87-137.

For our first scaling trials we used the 15 NSA items and the entire Hants group¹¹ but were unsuccessful in finding a scale. The large number of scale errors (non-scale types) made it obvious that not even 10 of the items would scale. Subsequent trials with more homogeneous groups (e.g. young males) met no greater success, nor did our next attempts based on a number of obvious "natural" combinations of other HCS items and homogeneous groups. The large number of item combinations possible from our 75 HCS questions made it seem fruitless for us to try for scales with all such random combinations.

Instead, we next tried to scale groups of items which a panel of five psychiatrists judged to be related to significant psychological dimensions, such as anxiety, degree of concern for the body, psychosomatic, optimism-pessimism, and hostility. Again, the data failed to scale, but parenthetically, these latter idea clusters proved valuable in a subsequent phase of the analysis involving latent structure, a special form of factor analysis. This will be described in another report.

To sum up our scaling trials - we failed to demonstrate that these HCS items tapped unidimensional aspects of the community or psychoneurotic informants' psychological attitudes. It seemed, instead, that they were disclosing multi-dimensional areas, and in view of certain variabilities of response exhibited by different

11. All scaling trials were supervised by Miss Jessie Cohen and the Cornell Social Science Research Center.

sub-populations in our sample¹² it appeared that portions of our test population might not have been answering certain of the items similarly. In other words, certain of our HCS items may have been tapping entirely different psychological components with different categories of community and psychoneurotic individuals. For the purposes of this paper, certain rather patent observations¹³ will be omitted at this point and we shall proceed with a skeleton discussion of the actual analytic process.

Alternative Analyses

The alternative computational approaches, in lieu of the Guttman scale, appeared to be:

1. Item analysis aimed at constructing a composite index.
2. Factor analysis to determine the number and types of variables involved in our data.
3. Latent structure analysis - a special variation of factor analysis - based on a variety of mathematical models from a simple dichotomy to a "continuum" scale.

Two considerations influenced the method of analysis to be selected. (1) We had earlier been able to construct a rough scale, while in the field, which identified 90% of the psychoneurotic group as responding unlike 85% of the community group. This apparent degree of success in discrimination, together with the economy of computations usually required for Item Analysis, disposed us towards

12. Not detailed here for sake of brevity.

13. For example - homogeneity of content of our test items; the adequacy of the degree of choice-range of our test item sampling; sub-cultural variation within our test populations; possible use of the Edwards-Kilpatrick "Scale Discrimination Technique", among others.

that first alternative. (2) The lack of adequate calculating facilities at Cornell University ruled out factor analysis. The pressure of the needs of the larger on-going research program forced upon us a consideration of the quickest method of building a symptom index. Hence we placed exploration of the more lengthy latent structure analysis as second in priority, to be undertaken only after we had developed a workable, though interim, neurotic index by the item analysis method.

A refinement of the "simple weights" method of item analysis is the discriminant function system of weighting the test items. Though this retains the objectionable feature of assuming that all the test items used are measuring the "same thing", it does take into some consideration the inter-relationship between the items, and, in a sense, does treat them as of varying importance in discriminating between two sets of measurements. The decision to proceed immediately with this form of item analysis was taken even during the later trials of Guttman scaling because of the time pressure.

The reader will excuse the lack of technical explanation in this report. It is sufficient to say here that the mathematical formulation is designed to accentuate, as much as possible, the differences between means, or averages, of two distributions, and thus "pull" the distributions as far apart as possible, but, at the same time, to structure each distribution in such a way as to "force" the measures within it to cluster about the mean. This, in effect, creates a mathematical "tension", based on the inter-relationships between the items, which allows as little overlap as possible between the two sets of measurements.

The Stirling statistician, G. E. McCreary, devised a specific variation of the usual mathematical method to make it applicable to the trichotomous nature of our HCS data. Our plan, then, was to select certain test items that community individuals and diagnosed psychoneurotics answered quite differently and, by means of the special mathematical procedure, to assign various weights to these different discriminating items so as to accentuate the differences existing between the two populations. If we were able to separate the two distributions adequately, we could use these items as our neurotic-symptom index.

Selection of Items. Since the complexity of the required computations increases roughly in geometric ratio with the number of test-items involved, we decided that between 15 and 20 items would be the maximum we could work with by hand computation. These items should be those most highly discriminating between the two populations, in contrast to items for Guttman scaling, which should be of various discriminations. A Chi Square analysis of the Hants-psychoneurotic comparison data proved 40 of the 75 test items as distinguishing between the two groups at the 1% level of confidence. For discriminant analysis, about half of these would be sufficient. An early comparison of 20 items for the Hants 300 and a Fn group of 50 is given in Table 4, on the two following pages. It should be noted that this comparison was made before subsequent work added an additional 25 psychoneurotics to the total used in other of our computations.

Table 4

Comparison of Hants 300 and In groups responses
to 20 HCS questions

| HCS | Question Content | Answer Categories | Hants per-centage | Hosp. Pa percentage |
|-----|--|--|-------------------|---------------------|
| 12 | Has any ill health affected the amount of work you do? | Often Sometimes Hardly ever Never | 7 28 | 36 40 |
| 13 | Do you smoke? | A lot Some Not at all | 18 30 53 | 34 44 22 |
| 14 | Do you have any particular physical or health trouble? | Yes Undecided No | 36 5 59 | 58 18 24 |
| 15 | Do you ever have any trouble in getting to sleep and staying asleep? | Often Sometimes Never | 7 33 60 | 52 34 14 |
| 16 | Do your hands ever tremble enough to bother you? | Often Sometimes Never | 2 13 85 | 22 40 38 |
| 18 | Are you ever bothered by nervousness? | Often Sometimes Never | 11 51 38 | 46 48 6 |
| 19 | Have you ever been bothered by your heart beating hard? | Often Sometimes Never | 7 34 59 | 28 52 20 |
| 21 | Have you ever had spells of dizziness? | Many A few times Never | 7 43 51 | 22 62 16 |
| 24 | Are you ever troubled by your hands sweating so that they feel damp and clammy? | Often Sometimes Never | 10 39 51 | 44 32 24 |
| 27 | Are you ever bothered by having nightmares? (Dreams that frighten or upset you very much?) | Many times A few times Never | 3 25 72 | 18 54 28 |

Table 4 (continued)

| HCS | Question Content | Answer Categories | Hants percentage | Hosp. Pn percentage |
|-----|--|------------------------------------|------------------|---------------------|
| 28 | Have you ever been troubled by cold sweats? | Often A few times Never | 1 18 81 | 18 44 38 |
| 30 | Do you have loss of appetite? | Often Sometimes Never | 4 36 60 | 34 56 10 |
| 34 | Do you feel that you are bothered by all sorts (different kinds) of ailments in different parts of body? | Often Sometimes Never | 3 26 71 | 18 46 36 |
| 41 | Have you ever felt that you were going to have nervous breakdown? | Often Sometimes Never | 2 22 76 | 18 50 32 |
| 55 | Did you ever have an old trouble that keeps coming back? | Often Sometimes Never | 7 28 66 | 26 32 42 |
| 56 | Do you tend to lose weight when you have important things bothering you? | No Undecided Yes | 65 11 24 | 24 20 56 |
| 57 | Do you ever get a pain over your heart? | Often Sometimes Never | 5 31 64 | 18 54 28 |
| 61 | Do you ever take weak turns? (Repeat "you know, weak turns") | Often Sometimes Never | 4 24 72 | 8 56 36 |
| 65 | Do you feel tired in the morning? | Never Sometimes Often | 26 48 14 | 12 32 56 |
| 83 | For the most part, do you feel healthy enough to carry out things you would like to do? | Usually At times Hardly ever | 68 23 8 | 12 62 26 |

Data gathering experience among the various sections of the two counties where we obtained interviews had impressed the writer with the probability that there were differences in the way some sub-populations viewed certain aspects of health. It seemed reasonable that, if there actually were such sub-cultural variations, we would be advised to use test items which represented the most universal aspects. This would lessen the possibility of our biasing the ultimate neurotic symptom index for any particular sub-group and, incidentally, of tending to increase the number of false positives which the test might produce if there were such distinctly different, but not necessarily pathological, attitudes. Certain dangers involved in using universal items were taken into consideration, but at this stage in our work the selection of universal items which "worked" in all community sub-groupings seemed to be desirable for a generally applicable index¹⁴.

A mathematical comparison was made of all 40 highly discriminating items among the psychoneurotic group and various sub-groupings; for example, Good farming, Average farming, Poor farming, Day labor and Urban. From this analysis we found 20 items which were highly discriminating (1% level of confidence - Chi Square test) between each of the groups. These we termed the "Universal Items". They are shown in Table 5, pages 34 and 35.

14. In this initial approach to producing a neurotic symptom index we do not forget the probable importance of elements within sub-cultures which provide special types of social settings in which the various individuals adopt patterns in a fashion commonly acceptable for his particular sub-group of the larger society. Such analysis is set aside for the time being.

Table 5

Universal HCS Items, Distinguishing at the 1% Level of Confidence
between Community Sub-cultural Groupings and Psych-neurotics

| HCS | Item | Detail | Answer Categories (Four part answers are combined for Q 12 and Q 20) | | |
|--------|------|--|--|------------------------|-----------------------|
| | | | "Sick" answer | Intermediate answer | "Well" answer |
| Q 12 | | Has any ill health affected the amount of work you do? | Often | Sometimes | Hardly ever and Never |
| Q 13 | | Do you smoke? | A lot | Sometimes | No |
| # Q 14 | | Do you have any particular physical or health trouble? | Yes | Undecided | No |
| # Q 15 | | Do you ever have any trouble in getting to sleep and staying asleep? | Often | Sometimes | Never |
| # Q 16 | | Do your hands ever tremble enough to bother you? | Often | Sometimes | Never |
| # Q 18 | | Are you ever bothered by nervousness? | Often | Sometimes | Never |
| # Q 19 | | Have you ever been bothered by your heart beating hard? | Often | Sometimes | Never |
| # Q 21 | | Have you ever had spells of dizziness? | Many times | A few times | Never |
| # Q 23 | | Have you ever been bothered by shortness of breath when you were not exercising or working hard? | Often | Sometimes | Never |
| # Q 24 | | Are you ever troubled by your hands sweating so that they feel damp and clammy? | Often | Sometimes | Never |

Table 5 (continued)

| HCS Item | Detail | Answer Categories (Four part answers are combined for Q 12 and Q 26) | | |
|-------------|---|--|------------------------|-------------------------|
| | | "Sick" answer | Intermediate answer | "Well" answer |
| # Q 26 | How often are you bothered by having an upset stomach? | Nearly all the time | pretty often | Not very much and Never |
| # Q 27 | Are you ever bothered by having nightmares? (Dreams that frighten or upset you very much?) | Long times | A few times | Never |
| # Q 28 | Have you ever been troubled by cold sweats? | Often | A few times | Never |
| Q 30 | Do you have loss of appetite? | Often | Sometimes | Never |
| Q 34 | Do you feel that you are bothered by all sorts (different kinds) of ailments in different parts of your body? | Often | Sometimes | Never |
| Q 41 | Have you ever felt that you were going to have a nervous breakdown? | Often | Sometimes | Never |
| Q 56 | Do you tend to lose weight when you have important things bothering you? | Yes | Undecided | No |
| Q 61 | Do you ever take weak turns? (Repeat "you know, weak turns") | Often | Sometimes | Never |
| Q 65 | Do you feel tired in the morning? | Often | Sometimes | Never |
| Q 83 | For the most part, do you feel healthy enough to carry out the things that you would like to do? | Hardly ever | At times | Usually |

These are 11 of the original 15 NSA items - four were of low discriminating ability for these populations and were dropped.

As a baseline, it had been assumed that the "Good farming" areas of both counties were most representative of the "well", symptom-free people in each county. This was corroborated by analysis which showed that not 20 but 35 and 36 items distinguished those two selected county groups from the psychoneurotic group, indicating that in terms of responses to the NOS the "Good farm" people in general answered quite unlike the people under treatment and, moreover, they answered more unlike the "sick" than did other community sub-groupings; Table 6 on page 37 indicates this clearly. It is to be remembered that the assumption of "Good farm" being more unlike the psychoneurotics was made before this phase of the analysis, and was founded in part on personal knowledge by the writer of all the areas sampled.

A close inspection of Table 6 shows that the 20 items selected as "Universal" have varying rank-orders with the different community adult groupings, and that selection of the 20 still leaves several highly discriminating items unused, particularly as far as the "Good farm" group is concerned. In general, though, the selected items tend to cluster towards the top of the rank-ordering, and it was decided a priori that we could not deal effectively with more than 20 items, since our mathematical calculating facilities lacked electronic equipment. Table 6 follows.

Table 6

Rank Order of HCS Items by Chi Square Size for Sub-areas
(All at or above the 1% level of significance)

| | KINGS Good Farming 55 | HANTS Good Farming 45 | KINGS Poor Farming 105 | HANTS Poor Farming 67 | KINGS Urban 47 | HANTS Urban 111 |
|--------------|--------------------------|--------------------------|---------------------------|--------------------------|-------------------|--------------------|
| 1 | Q 16 | Q 30 | Q 30 | Q 30 | Q 14 | Q 83 |
| 2 | 30 | 15 | 41 | 83 | 83 | 16 |
| 3 | 61 | 41 | 83 | 16 | 56 | 56 |
| 4 | 14 | 83 | 16 | 26 | 41 | 30 |
| 5 | 56 | 16 | 56 | 41 | 30 | 15 |
| 6 | 83 | 24 | 24 | 15 | 34 | 41 |
| 7 | 15 | 56 | 14 | 18 | 61 | 28 |
| 8 | 34 | 21 | 13 | 14 | 26 | 65 |
| 9 | 24 | 18 | 15 | 19 | 23 | 14 |
| 10 | 27 | 23 | 26 | 65 | 24 | 18 |
| 11 | 41 | 28 | 27 | 27 | 15 | 61 |
| 12 | 21 | 61 | 34 | 24 | 16 | 19 |
| 13 | 46 | 32 | 23 | 34 | 65 | 34 |
| 14 | 45 | 14 | 18 | 61 | 16 | 45 |
| 15 | 19 | 65 | 21 | 45 | 27 | 21 |
| 16 | 28 | 63 | 61 | 13 | 19 | 23 |
| 17 | 55 | 34 | 19 | 21 | 21 | 27 |
| 18 | 13 | 27 | 32 | 56 | - | 24 |
| 19 | 31 | 40 | 55 | 57 | (13)! | 57 |
| 20 | 23 | 52 | 50 | 23 | 0 | 20 |
| 21 | 57 | 19 | 52 | | | 13 |
| 22 | 18 | 57 | | | | |
| 23 | 20 | 69 | | | | |
| 24 | 43 | 70 | | | | |
| 25 | 32 | 46 | | | | |
| 26 | 76 | 44 | | | | |
| 27 | 52 | 55 | | | | |
| 28 | 54 | 54 | | | | |
| 29 | 50 | 45 | | | | |
| 30 | 44 | 20 | | | | |
| 31 | 65 | 82 | | | | |
| 32 | 47 | 50 | | | | |
| 33 | 37 | 13 | | | | |
| 34 | 57 | | | | | |
| Four Part | 12 26 | 12 26 | 12 26 | 12 26 | 12 26 | 12 26 |

! Question 13 was just below the one percent level of confidence for this group, and was retained, though in the strictest sense it was a shade outside the criterion we had set for the "Selected Items".

Derived weights. As the mathematical function of discriminant analysis is to separate two groups of measurements and to accentuate any differences that do obtain, it seemed most logical to use the "good farm" and the psychoneurotic response data as the basis for the discriminant analysis computation¹⁵ which was supervised by the project statistician.

The details of this analysis may be found in an accompanying article¹⁶. It will be sufficient for present purposes to indicate that we arbitrarily weighted the usual response pattern of the HOS as follows:

| <u>Answer</u> | <u>Weight</u> | <u>Type</u> |
|---------------|---------------|----------------------|
| Often | 0 | (Sick-like response) |
| Sometimes | 1 | (Intermediate - ?) |
| Never | 2 | (Well-like response) |

The mathematical analysis of the "Good farm" and psychoneurotic data produced an additional (derived) weight for each test item. For example, the derived discriminant analysis weight for a test item might be "7". We would now examine any individual's response to this item, and see that he has answered "Often". Hence, we would multiply the "Often" weight 0 (see above) by the derived weight of 7 and give him a score of zero (0)

15. Dr. C. R. Henderson of the Animal Husbandry Department at Cornell furnished valuable advice at an important stage of this mathematical processing.

16. McCreary, G. E., "The Use of the Discriminant Function in Estimating the Prevalence of Psychoneurotic and Related Types of Disorder", this report, pp. 73 - 97.

for his response to that item. If another informant answered "Sometimes", he would, by the same process, achieve a score of 7, while the informant answering "Never" would obtain 14 as his score for that item ($2 \times 7 = 14$).

Our method of arbitrary weighting, in effect, produces a scoring system which gives a higher score for the least psychoneurotic-like responses. For our immediate purposes, we might term this a "wellness" weighting procedure.

It will be noted that some of the test items received negative derived weights. An uncritical conclusion would assume that these test items have "no value" in discriminating between the community and the psychoneurotic group; however, this does not follow. We will recall that our Guttman scaling trials seemed to indicate clearly that we were dealing with more than one dimension or variable, so that among other things, we see here the mathematical effects of "forcing" the two response distributions apart to give the "best possible" combination of weights for these 20 items considered together. Readers with clinical experience will realize that "sickness" and "wellness", as applied to psychoneurotic symptomatology, are not found in "completely different" groups of people; that in actual experience we find a considerable overlap in behavior. This well known phenomenon provides a partial explanation of these negative weights.

The derived weights are shown in Table 7, on the following page.

Table 7

MOS Discriminant Function Weights
 "Good farm" and Psychoneurotic Comparison

| Selected Items | Derived Weights assigned Response-patterns | | |
|---|---|-----------|-------|
| | OFTEN | SOMETIMES | NEVER |
| Q 12 Ill health effected the work you do? | 0 | 6.7 | 13.4 |
| Q 13 Do you smoke? | 0 | 2.0 | 4.0 |
| Q 14 Particular health trouble? | 0 | 2.5 | 5.0 |
| Q 15 Trouble getting to sleep? | 0 | 3.0 | 6.0 |
| Q 16 Hands tremble...bother you? | 0 | 2.7 | 5.4 |
| Q 18 Bothered by nervousness? | 0 | -1.2 | -2.4 |
| Q 19 Heart beating hard? | 0 | 0.3 | 0.6 |
| Q 21 Spells of dizziness? | 0 | 1.4 | 2.8 |
| Q 23 Shortness of breath? | 0 | -2.0 | -4.0 |
| Q 24 Hands sweating...clammy? | 0 | 4.8 | 9.6 |
| Q 26 How often...upset stomach? | 0 | 7.9 | 15.8 |
| Q 27 Bothered nightmares? | 0 | 2.1 | 4.2 |
| Q 28 Troubled by cold sweats? | 0 | -5.7 | -11.4 |
| Q 30 Have loss of appetite? | 0 | 12.8 | 25.6 |
| Q 34 All sorts ailments...body? | 0 | 3.1 | 6.2 |
| Q 41 Felt...have nervous breakdown? | 0 | 6.2 | 12.4 |
| Q 56 Lose weight - important things? | 0 | 0.2 | 0.4 |
| Q 61 Take weak turns? | 0 | 2.3 | 4.6 |
| Q 65 Tired in the morning? | 0 | -2.7 | -5.4 |
| Q 83 Healthy - do things like to do? | 0 | -3.5 | -7.0 |

Assessment of Effectiveness

Comparison of Test Populations. All Hants-Kings and Psychoneurotic interviews were scored and distributions were assembled for the following groups:

- | | | |
|-----|--|--------------------|
| (1) | "Good farming" - Hants and Kings | N140 |
| (2) | All categories of Hants and Kings - termed "Combined" | N559 |
| (3) | Hants alone - all categories | N312 ¹⁷ |
| (4) | Hants and Kings less the "Good farm" - termed "Mixed" | N219 |
| (5) | Kings "Mountain" ("Poor farm") | N105 |
| (6) | Colored interviews - Hants and Kings | N 52 |
| (7) | Psychoneurotics - termed "Hosp In" | N 78 |

The various distributions are placed side by side for comparison in Table 8, on the following page, which shows both the numbers of interviews falling in each score-class and the cumulative frequency in percentages for each distribution calculated from the "Well" end of each. The "Well" scores are at the bottom of the table and the "Sick" scores towards the top.

17. Apparent discrepancies between these numbers and totals used earlier in this paper are accounted for by the fact that a number of interviews were added to certain categories, including the entire "Colored" group, during the course of the study.

Table 8

Community and In Distribution of Scores - Discriminant Function

| SCORES | I | | II | | III | | IV | | V | | VI | | VII | |
|-----------|-----------|------------|----------|------------|-------|------------|-------|------------|----------|------------|---------|------------|---------|------------|
| | Good Farm | | Combined | | Hants | | Lixed | | Mountain | | Colored | | Hosp En | |
| | N 140 | Cum % | N 559 | Cum % | N 312 | Cum % | N 419 | Cum % | N 105 | Cum % | N 52 | Cum % | N 78 | Cum % |
| 10.0-14.9 | 0 | | 0 | | 0 | | 0 | | 0 | | 1 | <u>100</u> | 1 | <u>100</u> |
| 15.0-19.9 | 0 | | 0 | | 0 | | 0 | | 0 | | 1 | <u>99</u> | 3 | <u>98</u> |
| 20.0-24.9 | 0 | | 4 | <u>100</u> | 3 | <u>100</u> | 4 | <u>100</u> | 1 | <u>100</u> | 1 | <u>97</u> | 6 | <u>94</u> |
| 25.0-29.9 | 0 | | 1 | - | 1 | <u>99</u> | 1 | - | 0 | - | 0 | | 7 | <u>86</u> |
| 30.0-34.9 | 0 | | 5 | <u>99</u> | 1 | - | 5 | <u>99</u> | 2 | <u>95</u> | 2 | <u>95</u> | 11 | <u>77</u> |
| 35.0-39.9 | 1 | <u>100</u> | 9 | <u>98</u> | 3 | <u>98</u> | 8 | <u>98</u> | 4 | <u>98</u> | 2 | <u>91</u> | 8 | <u>63</u> |
| 40.0-44.9 | 0 | - | 16 | <u>96</u> | 11 | <u>97</u> | 16 | <u>96</u> | 4 | <u>94</u> | 0 | - | 8 | <u>53</u> |
| 45.0-49.9 | 3 | <u>98</u> | 19 | <u>93</u> | 15 | <u>94</u> | 16 | <u>92</u> | 3 | <u>90</u> | 5 | <u>87</u> | 12 | <u>43</u> |
| 50.0-54.9 | 3 | <u>96</u> | 24 | <u>90</u> | 15 | <u>89</u> | 21 | <u>89</u> | 5 | <u>87</u> | 7 | <u>77</u> | 5 | <u>28</u> |
| 55.0-59.9 | 9 | <u>94</u> | 43 | <u>86</u> | 24 | <u>84</u> | 34 | <u>83</u> | 10 | <u>82</u> | 7 | <u>64</u> | 11 | <u>22</u> |
| 60.0-64.9 | 17 | <u>83</u> | 58 | <u>78</u> | 27 | <u>76</u> | 41 | <u>75</u> | 13 | <u>73</u> | 9 | <u>51</u> | 2 | <u>8</u> |
| 65.0-69.9 | 20 | <u>76</u> | 65 | <u>64</u> | 34 | <u>67</u> | 44 | <u>65</u> | 11 | <u>61</u> | 5 | <u>34</u> | 2 | <u>5</u> |
| 70.0-74.9 | 23 | <u>62</u> | 77 | <u>57</u> | 40 | <u>56</u> | 62 | <u>54</u> | 13 | <u>50</u> | 4 | <u>24</u> | 1 | <u>2</u> |
| 75.0-79.9 | 25 | <u>46</u> | 83 | <u>43</u> | 42 | <u>43</u> | 46 | <u>58</u> | 18 | <u>38</u> | 3 | <u>16</u> | 0 | - |
| 80.0-84.9 | 24 | <u>28</u> | 85 | <u>28</u> | 50 | <u>30</u> | 61 | <u>28</u> | 8 | <u>21</u> | 5 | <u>10</u> | 0 | - |
| 85.0-89.9 | 13 | <u>11</u> | 59 | <u>13</u> | 39 | <u>14</u> | 46 | <u>13</u> | 11 | <u>13</u> | 0 | - | 0 | - |
| 90.0-94.9 | 2 | <u>2</u> | 11 | <u>2</u> | 7 | <u>2</u> | 2 | <u>2</u> | 1 | <u>2</u> | 0 | - | 1 | <u>1</u> |
| 95.0-99.9 | 0 | - | 1 | | 0 | - | | | 1 | <u>1</u> | 0 | - | 0 | - |

NOTE: "well" end is the lower part of the table. As scores decrease towards the top of the table, the degree of similarity of response to the In group increases. Percentages are underlined and are cumulative from the "well" end of each distribution of scores. The score intervals, of multiples of five points, are chosen purely to condense the information. Smaller groupings would allow finer examination of the similarities and differences between sub-area groupings.

The assignment of a cutting point is an arbitrary matter. Ideally, it should be at such a place among the score-classes as to identify all the psychoneurotics as being on one side and all the community ("well") on the other side; in other words 100% prediction with no false-positives or false-negatives. But we know that not even clinical examination achieves this degree of accuracy, so we must expect the cutting-point to do one of two things: (a) it will identify every neurotic but may identify several "wells" as neurotics too, or (b) it mis-classifies the minimum number of "wells" but misses some neurotics. A third possibility is to use two cutting points, one above point "x", for instance, where we are quite sure that all are "well", and one below "y" where we are similarly sure that all are "sick". In the score interval between the two points "x" and "y" we find a group we must assess as "doubtful".

The placing of cutting-points is thus largely dependent on the aims of the researcher. Also the more rigorous the definition of the two groups with respect to the aspect under study, the easier it is to establish such points. In our study the psychoneurotic group was rigorously defined, since it consisted of diagnosed psychoneurotics. Our community group could not be similarly defined as free from psychoneurosis. The assumption that the "Good farm" people represented the "well" sub-culture in both counties was based on the writer's knowledge of the inhabitants and their environment, which was generally advantageous in terms of level of living (for this

region), economic security, communication with major centers in all seasons, nearby urban supply and service areas, medical and other health facilities, education, and the like.

The balance of our community sampling, called the "Mixed" group, was composed of individuals representing a number of categories such as day-laborers, and farmers from average and poor farms.

It was presumed that these, particularly the "Poor farm", would be less "well", as a group, than our "Good farm" informants. "Poor farm" informants were varied, but included combinations of the following: subsistence farming on marginal land, poor general living standards with few comforts, isolation from urban or other centers (by such features as mountains, rivers, great distances, poor transportation facilities), and poor educational and religious facilities.

These assumptions were borne out, as an examination of Table 8 indicates. Toward the "well" end of the score-scale there is little difference in the percentages, but towards the "sick" end we find that the "Mixed" group tends to spread over a larger range. The "Combined" group distribution is between the two. If a cutting-point were introduced between scores 55.0 and 54.9, the groups would be dichotomized as given in Table 9, on the following page, indicating that the "Mixed" group contains a larger proportion of informants who answered as did the psychoneurotics.

Table 9
Score Distributions with Cutting Point at 54.9-55.0

| Cutting Point | Good farm | Combined | Mixed | Colored | In |
|---------------------------|-----------|----------|-------|---------|-----|
| Scores 54.9 and lower | 6% | 14% | 17% | 36% | 88% |
| Scores 55.0 and higher | 94 | 86 | 83 | 64 | 12 |

Graphic Examination. The three white community distributions, as compared with the In group, are graphically represented in Charts I, II, and III on the following three pages. "Sick" and "well" responses are scored on the base lines and 59.9-60.0 is used as the cutting point.

Chart I shows that eight per cent of the diagnosed In group responded to the 20 HCS items in a fashion similar to 88 per cent of the "Good farm" group, and on the other side of the cutting-point we find 92 per cent of the In and 12 per cent of the "Good farm". Since we know all the In are "sick", by definition, we can say for screening purposes that the eight per cent scoring above the cutting-point are false negatives, according to the test set at this cutting-point.

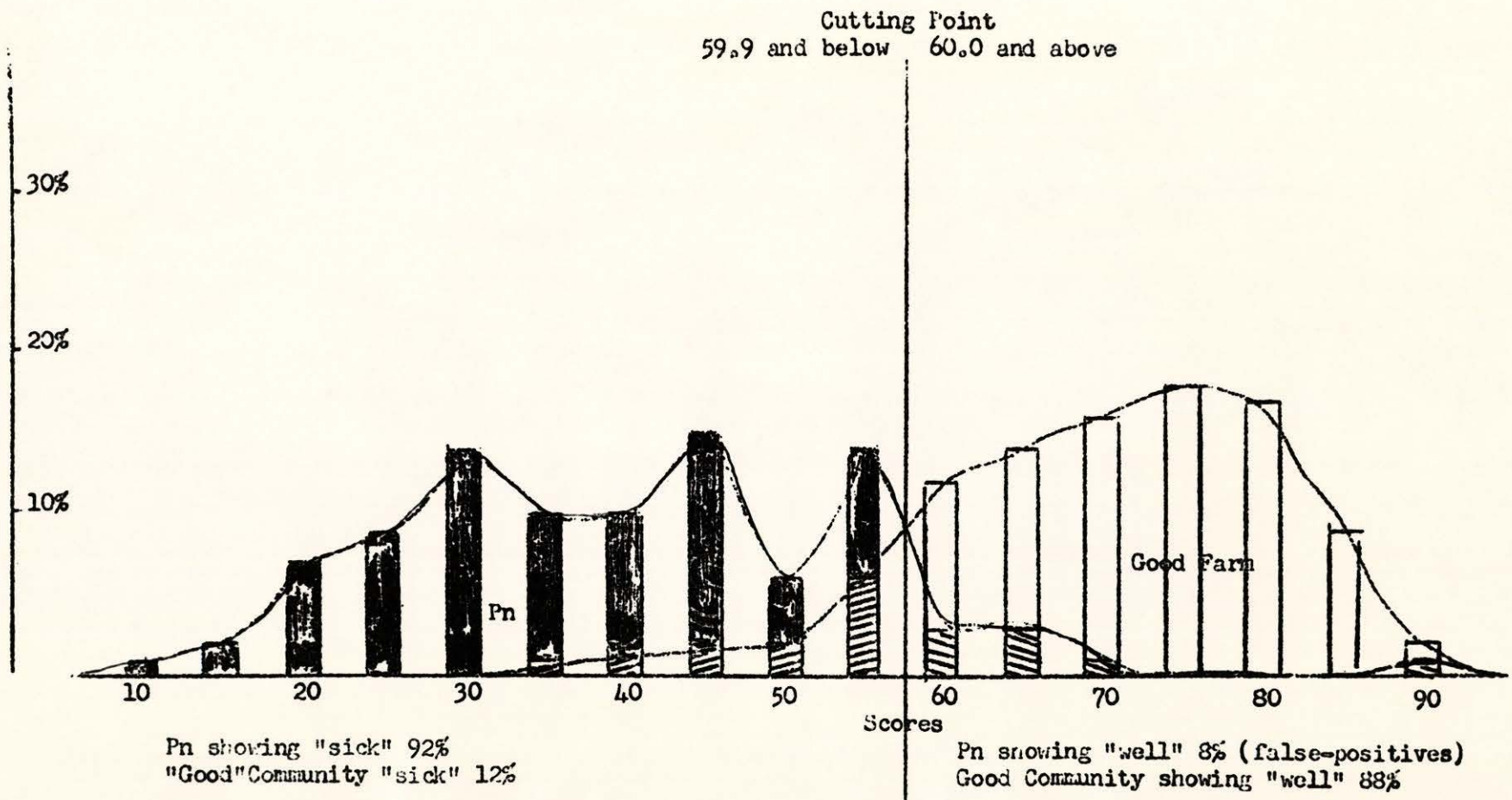
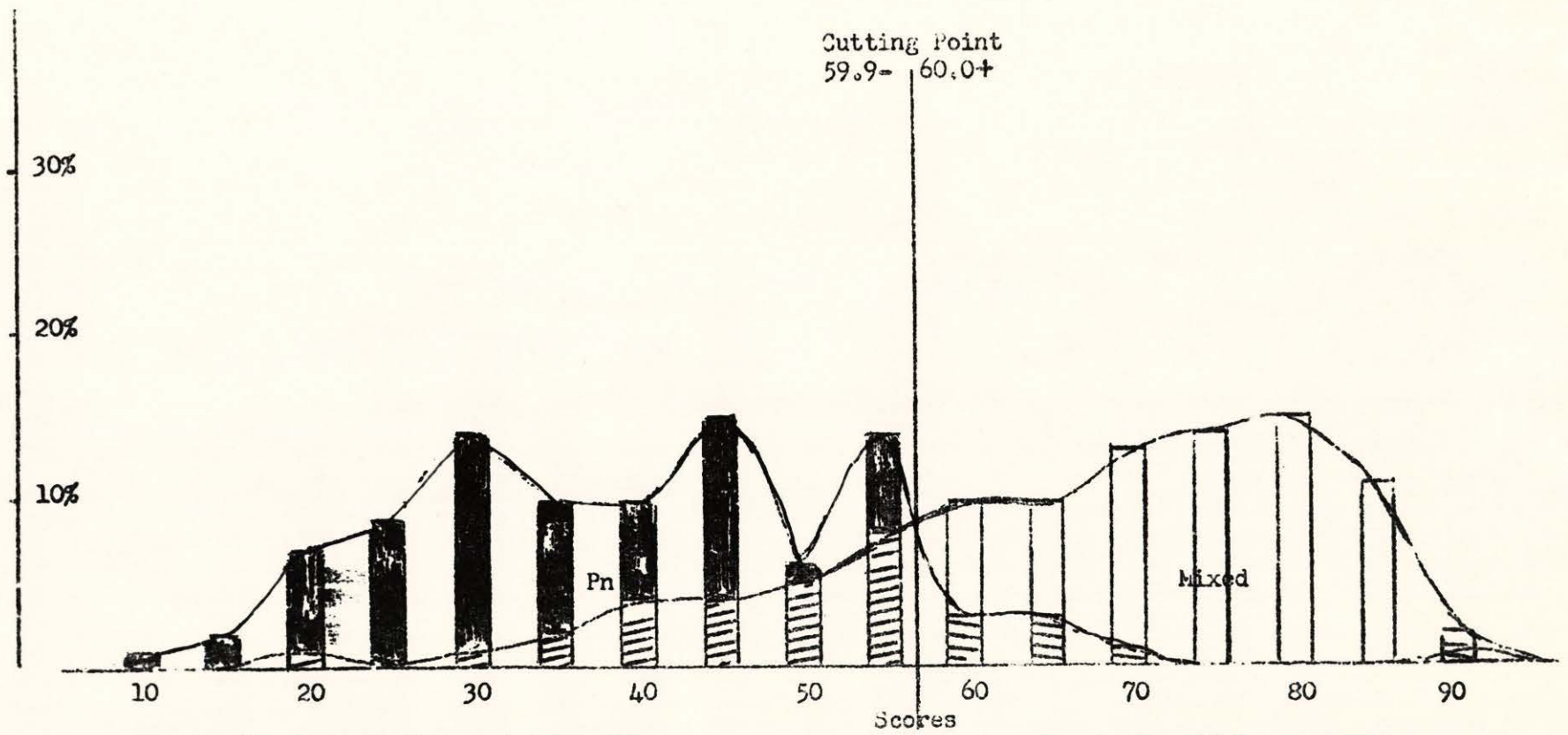


Chart I



Pn showing true-positives (sick) 92%
Mixed showing "sick"

Pn showing 8% False-positives
Mixed showing 75% as "well,"

Chart II

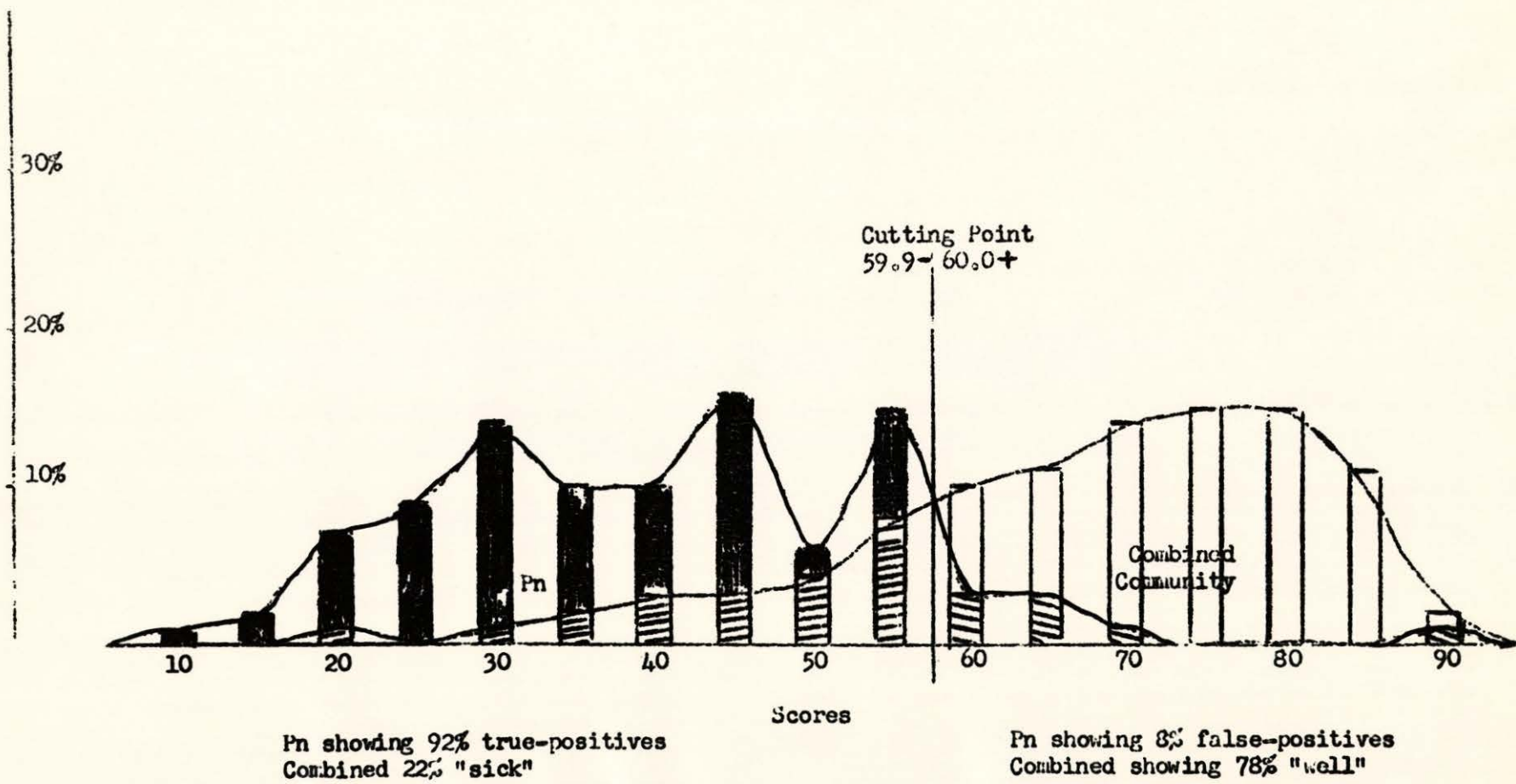


Chart III

However, we cannot be sure that the 12 per cent of the "Good farm" group found scoring below the cutting-point are, similarly, false positives. The same uncertainty obtains for 25 per cent of the "Mixed" group on Chart II, and for 22 per cent of "Combined" Hants-Kings on Chart III.

As noted earlier, it was impossible to insure that all individuals in our "well" groups actually were "well". It was possible that the groups, as scored on these graphs, contained a number of true positives. There were several ways by which we could make fairly reliable checks on the mental health of the individuals in our groups. One involved a re-check of the field data.

Field Notation Criteria. The field notes made at the time of the interviews had included notations of any behavior which had seemed possibly related to mental health. The interviewers were admittedly not equipped to make diagnoses, but they had been carefully instructed as to what general reactions might be significant.

These Field Notations of the Hants sampling have been scrutinized by the writer, since the results on Charts I, II, and III were obtained, and the following is a summary of the findings. It is important to keep in mind that the notations were made out at the time of the interview, while the scores were derived quite independently some months later at Cornell.

(a) History of "nervous breakdown"

Six informants verbalized what was taken to be a history of "nervous breakdown". Their ROS scores are 62.3, 58.8, 49.4, 45.0, 42.9, and 38.1. This last score was of a male undergoing psychiatric treatment.

(b) Other more direct observational notations - with scores.

| <u>Score</u> | <u>Notation</u> |
|--------------|---|
| 44.4 | "Takes drugs" |
| 47.1 | "Nervous and fearful" |
| 51.8 | "Doubtful if well - talked of great ulcers on skin which pills couldn't help - incoherent - many pills" |
| 48.7 | "Has stomach ulcers" |
| 48.8 | "His wife is in mental hospital" |
| 46.2 | "Hunch-back - seems concerned about health" |
| 55.0 | "Answers appeared to be related to her pregnancy" |
| 52.7 | "Very nervous - ulcers - low blood pressure" |
| 51.1 | "Claims she has 'much nervous trouble'" |
| 21.1 | "Claims two nervous breakdowns" (not incl. above) |
| 70.0 | "Has had five miscarriages" |
| 44.7 | "Doubtful if well, dizzy spells, 'black-outs' and insomnia" |
| 49.0 | "Certainly seems to be in poor shape" |
| 37.5 | "Doubt if well, 'nervous spells at times'" |
| 60.8 | "Poor health - stomach nausea - sad-looking" (depressed) |
| 56.6 | "Lello - recovering 6to years" |
| 49.3 | "Related everything to his 'sinus trouble'" |
| 50.5 | "Sin trouble - kidney trouble, 'especially when I am upset or nervous" |
| 57.3 | "Religious crank - thinks the local church not keeping up with principles - arthritic" |
| 39.0 | "Everything caused by my nerves' - trouble with ovaries, etc." |
| 51.2 | "Cynical - grouchy - social" |
| 42.8 | "Gall bladder trouble, 'displaced female organs', erratic, indecisive" |
| 60.6 | "War II leg amputee" |
| 33.4 | "Long history of illnesses" |
| 67.6 | "Arthritis" |
| 81.4 | "Social - not enjoy social gatherings" |
| 77.0 | "Says she is nervous" |
| 50.6 | "Doubtful if he's a well man" |
| 44.8 | "Difficulty keeping emotionally stable during interview" |
| 24.5 | "Nervous - has 'pain in the forehead the doctors can't seem to cure' - very poor health" |
| 49.4 | "History of fainting in school and on into adult life" |
| 75.8 | "History mental hospital - diagnosis?" |

| <u>Score</u> | <u>Notation (continued)</u> |
|--------------|--|
| 46.1 | "Nervous, etc." |
| 77.5 | "Social - stays away from people - keeps the door locked" |
| 40.2 | "Many bodily ailments - complains of 'ligaments'" |
| 68.8 | "Pregnant" |
| 56.9 | "Claimed that 'nervousness was her main trouble'" |
| 60.9 | "Social? - took great persuasion to come" (for interview) |
| 73.7 | "Claims to have 'nervous condition'" |
| 57.8 | "Lobectomy" |
| 28.5 | "Folio at 9 yrs. 'caused her nervousness ever since'" |
| 56.8 | "Bothered by heart condition" |
| 41.6 | "I am a nervous person" (bachelor 56 yrs.) |
| 44.7 | "'Nervousness is my main trouble'" |
| 52.5 | "He 'tires easily' (36 yrs.) - when approached for the interview he felt stomach nausea - he told us afterwards" |

(c) Fully quoted notation

The above have been condensed. Herewith is an example of fuller notations made in the case of a middle-aged male who had "avoided" being available for the interview on at least two previous occasions, but has just been interviewed - the record, here, is verbatim. It is to be noted that these are all made directly following the interview.

"Eureka! We got him! Was quite willing. Sat with head held down, and looked rather glum as though he were unhappy. Perhaps his wife is the dominant character in this relationship. She is certainly capable of it. He didn't mention any specific ailment but from the answers given he doesn't always feel too well - i.e. loss of appetite, food tasteless, pain over heart, weak turns, and to (41 (Have you ever felt you were going to have a nervous breakdown?) he said, 'Well, I don't know how to answer that...I know sometimes I get to feel like hollering'".

(His HCS score is 53.2)

(d) Probability of "sick-like" notations

A listing was made of all the "low" scores of the Hants group (below 60.0) and a check made as to whether or not there was any correspondence between a "low" score (only

known at Cornell, after the fieldwork was over) and the number of notations like those given in (a), (b), and (c) above. Here is the result:

| <u>Score</u> | <u>Notation Made</u> | <u>No. Comment</u> | <u>Probability</u> |
|--------------|----------------------|--------------------|--------------------|
| 20's | 3 | 1 | 2.0 |
| 30's | 4 | 0 | 2.0 |
| 40's | 19 | 8 | 13.5 |
| 50's | <u>16</u> | <u>19</u> | <u>17.5</u> |
| Totals | 42 | 28 | 35.0 |

This summary indicates a fair correspondence between observed signs suggestive of poor mental health and the scores compiled by the independent statistical processing of HOS answers. Further, these kinds of "difficulties", symptoms, and observed signs are very similar to the kinds of behavior and symptoms characteristic of psychoneurotics¹⁸. This independent evidence aids considerably in assessing the mental health aspects of the population distributions on either side of the 59.9-60.0 cutting-point, but does not help with the problem of the degree of error in the placement of the cutting-point¹⁹.

18. See Lyerson, A. "Neuroses and Psychoneuroses: the Relationship of Symptom Groups", Am. J. Psychiat. 1936, Vol. 93, pp. 263-301; and, Grinker, R. K. and Spiegel, J. P., Men under Stress, Philadelphia: Blakeston, 1945, as reviewed by Cattell, R. B. in Personality, New York: McGraw-Hill, 1950, pp. 487-488.

19. For discussions pointing to the validity of individuals' responses to such health items, we refer the reader to the large literature on the topic. For example, Ellis, A. and Conrad, H. S., "The Validity of Personality Inventories in Military Practice", Psychol. Bull., 1948, pp. 385-426, and a series of papers on the Cornell Medical-Index Health Questionnaire by Keeve Brodman, Irving Lorge, Harold G. Wolff and others in J. Am. Med. Ass., June 7, 1952, Vol. 149, pp. 550-551; Clin. Psychol., July, 1952, Vol. 8, 3, pp. 289-293; Geront., July, 1953, Vol. 8, 3, pp. 339-342; Am. J. Psychiat., July 1954, Vol. 3, 1, pp. 37-40.

Psychiatric Criterion. During the interviewing of the community informants it was not possible to arrange for an assessment by a psychiatrist, but about a month later a further independent check on the validity of the HCS responses was made by having a psychiatrist examine a 12 per cent sample (N64) of the Hants and Kings community informants. The sample was chosen in the following manner. Early in the analysis of the data obtained from field interviewing, we established a tentative "field scale" of neurosis. All interviews were scored on this scale, which indicated a range from lack of any signs of neurosis to severe signs. We selected 25 per cent of the sample from each end of the scale, and 50 per cent from the "middle" section²⁰. The results of these psychiatric examinations compared to the HCS discriminant analysis (DA) scores are given in Table 10 on page 55.

On the left are the scores in descending order from "well" to "sick". The horizontal scale across the top corresponds to the psychiatrist's ratings of need for treatment, except that his category III indicates uncertainty as to whether the informant should be placed to the right or to the left. A second psychiatric assessment, diagnostic description, is given for each informant opposite the score later derived from his HCS answers and under the appropriate "degree of need" category.

20. The psychiatrist had no knowledge of the informant's responses to the HCS questions at any time. Also, he was not told how the sample was selected, only that random methods were used. He did not know that we had developed "field scores" for these informants.

The diagnostic descriptions are summarized for this table by symbols: N is "Normal"; In or IN is neurotic, with the lower-case "n" indicating "minor" and the upper-case "I" "major"; similarly Pn or PN denotes "Character Disorder"; Ip or IP is "Psychotic"; and Pn or PN designates "Psychoneurotic". It is to be noted that some of these community informants received a multi-diagnostic description as designated by extra symbols in parentheses, and in cases where the psychiatrist felt uncertainty about the description, a question mark was added.

Table 10

Psychiatric Assessment by Diagnosis and Degree of Need for Therapy
of Recheck Sample Compared to HCS-DA Scores

| HCS-DA | Degree of Need for Therapy | | | | |
|--------------------|----------------------------|-------------|-------------|--------|-------|
| | "Well" | | "Uncertain" | "Sick" | |
| | I | II | III | IV | V |
| 91-89 | NN | | | | |
| 88-86 | N | N | | | |
| 85-83 | NNNN | | | | |
| 82-80 | N | | | | |
| 79-77 | | Ic In | Is In | | |
| 76-74 | | N(s?) | In | | |
| 73-71 | | | In In | | |
| 70-68 | N(p?) | In In Is Is | | | |
| 67-65 | N | | In | | |
| 64-62 | NNNN | | | | |
| 61-59 [#] | N | Ic Ic? In? | Is | FF IC | |
| 58-56 | | | In(s) In | | FN |
| 55-53 | N(c) | | Pp | | FN |
| 52-50 | N | | In In | FN | |
| 49-47 | | | In(c) In Is | FN | |
| 46-44 | | | In(c) | FC FN | |
| 43-41 | | In | Ic | | FN FN |
| 40-38 | | | | FC | |
| 37-35 | | | In In | FN | |
| 34-32 | | | In(s&c) | | |
| 31-29 | | | In In | | |
| 28-26 | | | | | |
| 25-23 | | | | | |
| 22-20 | | | In | | |

The score-class 61-59 is taken as the border-line area

The gross pattern of concurrence between HCS-DA scores and the psychiatric assessment is clearly demonstrated in the table. Those community informants definitely diagnosed in the "well" categories I and II bulk in the higher scoring area delineated above the upper cutting-point and to the left, while all of the "sick" in IV and V have scored below this line and to the right of the table. The psychiatrist's "uncertain" in III are divided roughly one-quarter above and three-quarters below the upper cutting-point. The overall relationship is summarized in Table 11.

Table 11

Relationship of Psychiatric Rating and HCS-DA

| Assessment Category | HCS - Degree of Concurrence | | | | | | |
|---------------------|-----------------------------|-------------|-------|---------|---------------|---------|--|
| | Agree | Border-line | Wrong | % Agree | % Border-line | % Wrong | |
| I ("Well") | 14 | 1 | 2 | 82% | 6% | 12% | |
| II ("Well") | 8 | 3 | 1 | 67 | 25 | 6 | |
| Total | 22 | 4 | 3 | 76% | 14% | 10% | |
| IV ("Sick") | 6 | 2 | 0 | 75 | 25 | - | |
| V ("Sick") | 4 | 0 | 0 | 100 | - | - | |
| Total | 10 | 2 | 0 | 83% | 17% | 0 | |

Our validating psychiatrist rated 29 community adults "well" (I and II) and the HOS scores identified 76 per cent of them, designated 14 per cent in the border-line area, and misclassified 10 per cent as "sick". Of the 12 adults assessed as "sick" by the psychiatrist (IV and V), the scores correctly identified 75 per cent, placed the other 25 per cent in the border-line area, and misclassified none as "well".

The examining psychiatrist's estimate of his error of definite classification, categories I, II, IV and V, was between 10 and 15 per cent, "probably 15 per cent", in this rather atypical assessing situation.

His "uncertains" (III) could not be estimated for error, by definition, but since they total 36 per cent, they pose some problems in view of our having no positive psychiatric definition of "uncertain".

Briefly, then, the HOS-DA scoring has approximated the psychiatric analysis quite closely. The psychiatrist rated 45 per cent as "well", 19 per cent as "sick" and 36 per cent in the "uncertain" category. The HOS with twin cutting-points rated 44 per cent as "well", 45 per cent as "sick" and placed 11 per cent in the "border-line" category. For the definitely rated groups, the test showed only 10 per cent error (false positives) and no false negatives. It is an open question, of course, as to whether the apparent false positives would remain such after a more

extensive psychiatric examination. These are very gratifying results but caution is needed in generalizing from this sample to any larger group, even in the same sub-cultural area from which we draw our interviews. In addition, we should remember that this unusual kind of psychiatric assessment probably has a very different degree of error from that of the typical clinical examination. There is need for more extensive sampling with the HOS in a wider variety of communities before generalizations can be made. However, we can note that data obtained in New York City and in North Carolina²¹ appear to indicate generally similar patterns of response.

Comparison of Distributions by Sex Groups. The random sample from Hants County was a fairly typical cross section, while the Kings County sampling was undertaken primarily to increase the overall number of informants for statistical comparisons and to include a further variety of sub-cultural groupings. Let us examine the Hants responses in more detail. Table 12 on the following page indicates the mean scores for both "young" (20-39) years and "old" (40-59 years) of both sexes for rural and urban parts of the county, and the mean for the entire county sampling.

21. Personal communications.

Table 12

Mean HOS Scores by Age and Sex - Hants

| | Male | | Female | |
|------------|------------|------------|-------------|------------|
| | Young | Old | Young | Old |
| Urban Mean | N22 "71.1" | N21 "68.1" | N42 "68.7" | N26 "71.6" |
| Rural Mean | N47 "71.0" | N36 "70.5" | N66 "69.8" | N52 "69.2" |
| Hants Mean | N69 "71.0" | N57 "69.0" | N108 "69.4" | N78 "70.0" |

(County Mean, All Informants "70.0")

The most striking feature here is the proximity of the means of all age or sex groups and the county mean. A further breakdown into county sub-areas (Table 13) does not disclose any specific pattern of "high" or "low" for either age or sex. Certain differences noted may be only apparent, since some of the groups here are very small.

Table 13

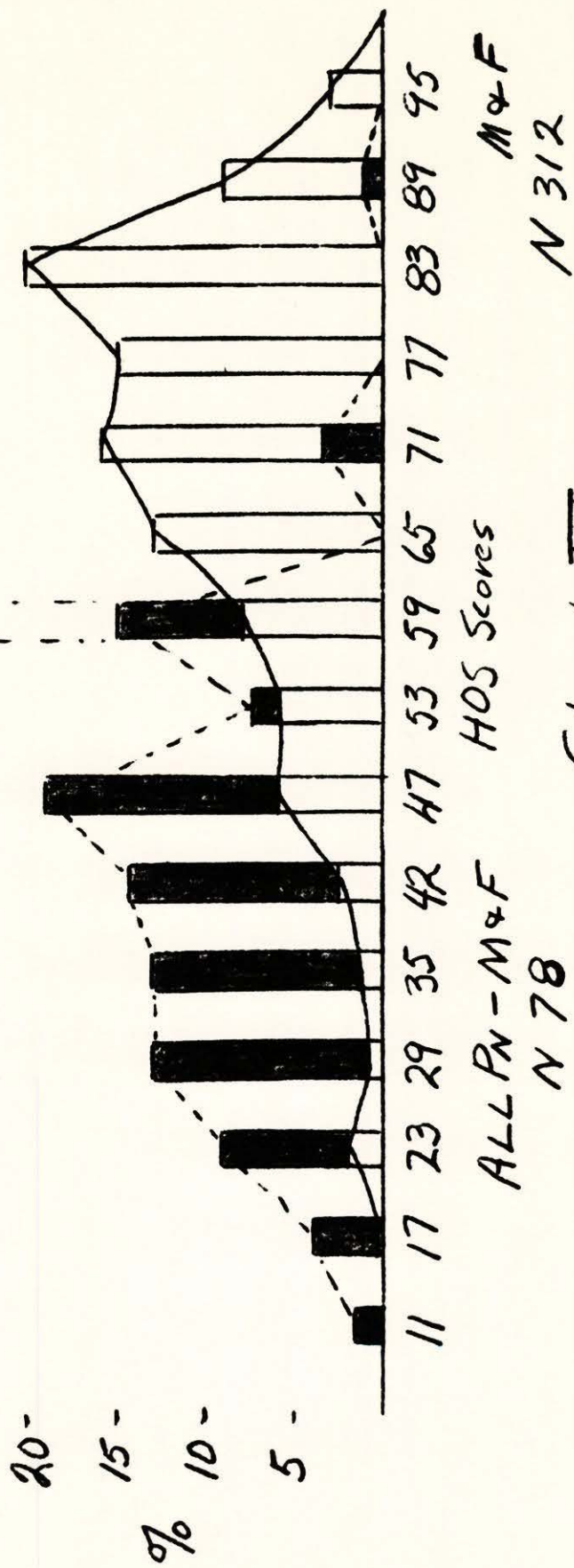
Mean HOS Scores by Age and Sex - Hants

| | Males | | Females | |
|--------------|-------|------|---------|------|
| | Young | Old | Young | Old |
| Good farm | 72.8 | 63.0 | 74.1 | 73.8 |
| Average farm | 71.7 | 70.4 | 73.9 | 68.1 |
| Poor farm | 67.6 | 74.9 | 66.7 | 64.4 |
| Day Labor | 75.1 | 65.9 | 58.8 | 69.0 |
| Urban | 71.1 | 68.6 | 68.7 | 71.6 |

Let us examine the Hants scores compared to scores of the diagnosed psychoneurotics. The total distribution of both sexes is shown on the next page in Chart IV. The twin cutting-points here are at the 59 score-class. We have just seen that the mean Hants score was at 70 (see Table 12) but the distribution is plainly not symmetrical about the mean. The modal score-class is 83, to the right on the chart. To the left, where the psychoneurotics bulk, we find a long Hants tail extending nearly to the extreme "sick" score-class.

In view of our evidence in the field notations and the psychiatric assessment, it would seem that the community informants in and below the 59 score-class are certainly suspect in terms of their mental health. Another problem is that part of the psychoneurotic distribution extends into the apparent "well" end of the Hants distribution to the right.

Examination of the sex distributions separately illuminates this question. In Chart V on page 62 the Hants males are compared to the Fn males. We note that, with the mean still at approximately score 70, the modal score-class is 83 (23 per cent of the males) and the distribution breaks sharply after 59 to fall rapidly to 35. In other words, no Hants males have scored below the 41 score-class, and only 16 per cent have scored below the "uncertain" area, which includes slightly more than 12 per cent. The Fn males also show a relatively smooth distribution and none scored above 59.



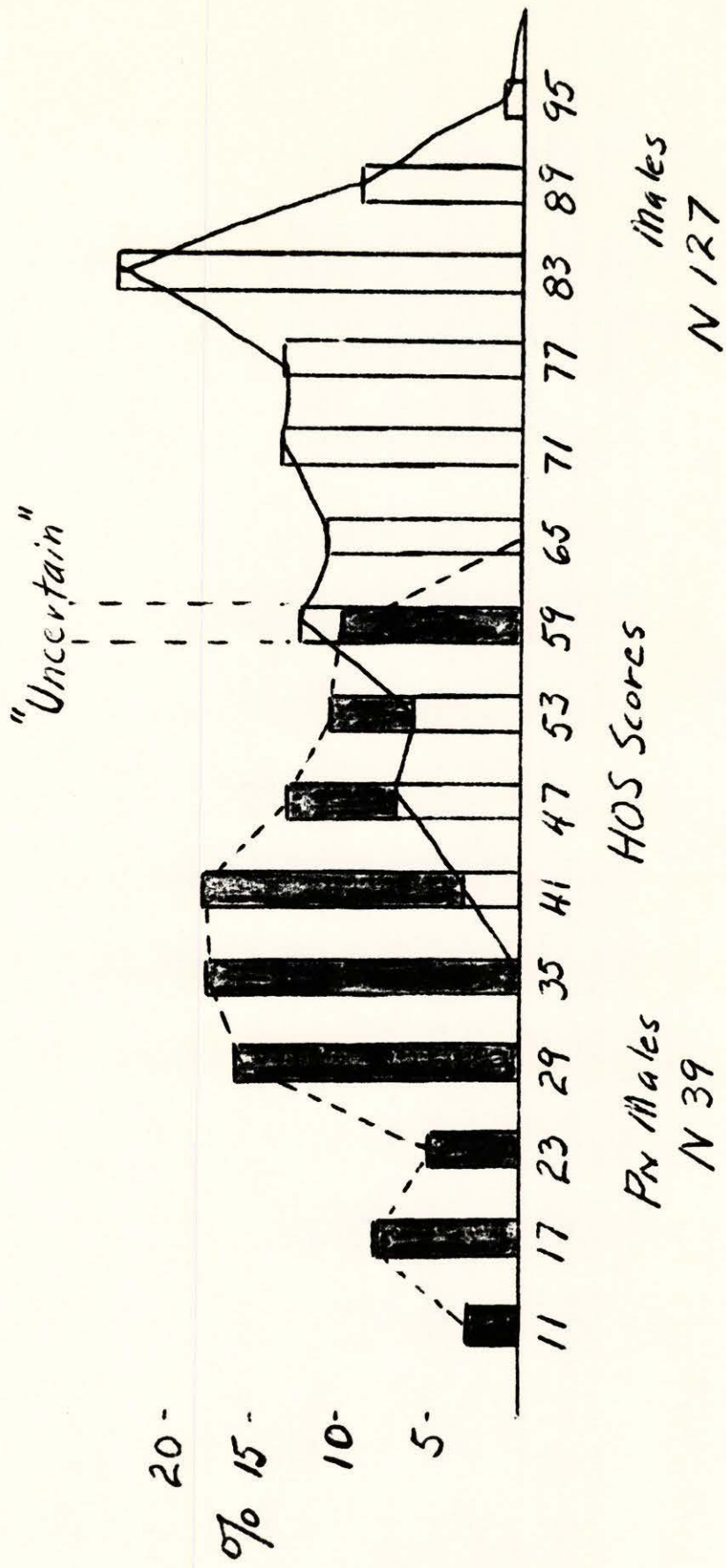
"Uncertain"

HOS Scores

M&F
N 312

ALL PN - M&F
N 78

Chart IV



HOS Scores

Px Males
N 39

Males
N 127

Chart IV

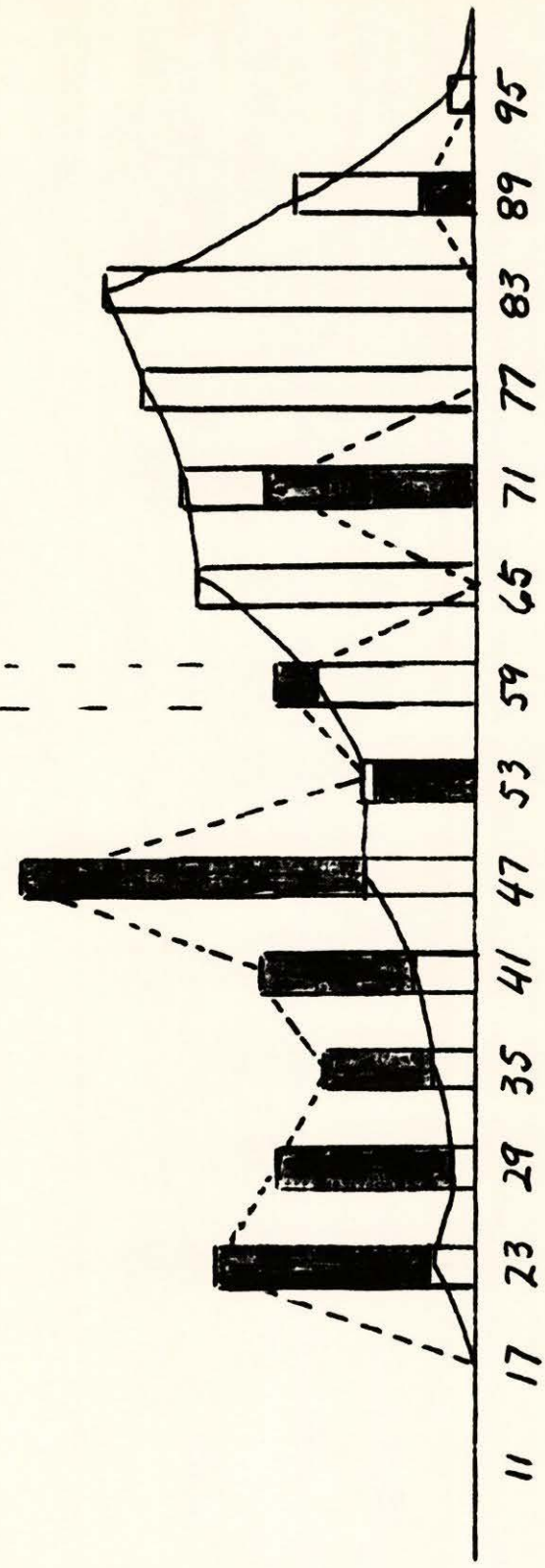
In Chart VI the females of both groups are compared. We are immediately struck by the long tail of the community females, extending to the left to the full limit of the In end of the scale, and by a somewhat similar extension of the In female distribution almost to the top limit of the community female end of the scale. Another feature is the apparent variability among the female In's as indicated by the very irregular shape of the distribution. We see that it is the In females that are causing our "false-negatives" (scoring like "wells") and not the In males.

It is thus apparent that the HCG-Da symptom index discriminates the sexes somewhat differently. The clear pattern for the males, as indicated by Chart V, suggests that the index may prove useful for screening out community males who may be in need of psychiatric treatment. For the females, we cannot make as positive a statement.

We know from clinical and everyday experience that frequently the female in our western culture appears more prone to discuss health matters, to have "complaints" and to express concern for health than does the male. This is not in any way proved by the results given here but it would also be presumptuous to infer that such differences do not exist for the populations studied. That approximately equal proportions of community males and females were scored as "well" is probably a function of the fact that our discriminant weights were derived from the combined male and female data. In other words, a real difference between the sexes, such as

"Uncertain"

20
15
10
5
%



Females
N 185

Pn Females
N 39

HOS Scores

Chart VI

we experience in clinical practice, is obscured by the mathematical processing of the responses of both sexes. That we have been able to demonstrate differences between psychoneurotics and community people, in spite of the fact that we are using combined data, is therefore a strong indication that further analysis of the data taking sex into account will provide two valuable symptom indices for use in community populations.

Present Considerations

Our current work on the BCS materials is in three areas: (1) clarification of sex differences, (2) cross-validation, and (3) refinement of the gross index. The first two are aimed at improving the test for the purpose of additional field measurements in Stirling County during the coming year; and the last, to explore the value of the test in providing a more accurate categorization than the crude "sick", "uncertain" and "well" designations. This includes a review of our latent structure analysis which divides individuals into two probability groups under a variety of psychiatric headings such as anxiety, degree of concern for the body, hostility, optimism-pessimism, and the like. The writer's working hypothesis, somewhat like Wolff's²² is that individuals acquire characteristic modes of physiological and psychological reaction to their physical and social environments at any particular stage in their developmental history. Further, while these are

22. Leighton, A. H., "Psychopathology and Social Environment - Suggestions toward a Frame of Reference", Stirling Report #166, (Mimeo) Cornell 1954, serves as our basic general approach to these problems. Also see Simmons, L. M. and Wolff, H. G. Social Science in Medicine Russell Sage Foundation, 1954, Chap. 5; and Wolff, H. G. Stress and Disease, Springfield, Thomas, 1953.

individual modes, in the extreme sense, they can probably be categorized for measurement purposes into perhaps a dozen types of reaction for any given situation.

Summary

The work to date on the Health Opinion Survey (HOS) materials indicates that even in its present relatively unrefined state the test may prove, with wider sampling, to be a valuable tool for use in estimating the gross proportions of individuals in communities who indicate physiological and psychological symptomatology closely related to psychoneurosis. It is short, requires no highly skilled interviewer or interpreter, and contains test items that are inoffensive. We hope it may prove of value as a survey-type instrument in public health administration for:

- (1) obtaining estimates of the varying needs of different ecological areas for mental health facilities; and,
- (2) estimating changes in those needs over periods of time, by follow-up surveys, to assess the effectiveness of current facilities, etc.

In addition, while not intended as such, it may be of use in individual cases in the regular physician's medical practice, and in various kinds of clinical and hospital admission situations.

CORNELL HEALTH OPINION SURVEY

QUESTIONNAIRE

- (1) How long have you been living in your community?
- (2) What work are you doing? (adapt to situation).
- (3) Have you been in this work for the past five years? (Adaptable)
(History of immediate past work if recent).
- (4) Were you born around here? (If it hasn't been noted in (1)).
- (5) What is your racial origin? (English, Irish, etc.)
- (6) What is your marital status? M. S. D. W. Mr.
- (7) Have you ever served in any of the Armed Forces? (if reasons are volunteered for NOT being in, note it down).
- (8) Do you attend or belong to any particular church? What denomination?
- (9) Do you think that there are enough doctors, dentists, nurses, hospital care in your community?
(a) Yes (b) Yes (c) Yes (d) Yes
 Undecided Undecided Undecided Undecided
 No No No No
- (10) Do you think the children in this area know enough about good health rules?
 No Undecided Yes
- (11) Do you think that the general health of the people in this area is
 Poor Fair Good
- (12) Has any ill health affected the amount of work you do?
 Often Sometimes Hardly ever Never
- (13) Do you smoke a lot? Some Not at all
- (14) Do you have any particular physical or health trouble?
 Yes Undecided No
- (15) Do you ever have any trouble in getting to sleep and staying asleep?
 Often Sometimes Never
- (16) Do your hands ever trouble enough to bother you?
 Often Sometimes Never
- (17) Have you ever had any fainting spells?
 Several Times A few times Never
- (18) Are you ever bothered by nervousness?
 Often Sometimes Never
- (19) Have you ever been bothered by your heart beating hard?
 Often Sometimes Never
- (20) Have you ever been bothered by pressures or pains in the head?
 Never Sometimes Often
- (21) Have you ever had spells of dizziness?
 Many times A few times Never
- (22) Do you ever bite your fingernails now?
 Often Sometimes Never
- (23) Have you ever been bothered by shortness of breath when you were not exercising or working hard?
 Often Sometimes Never
- (24) Are you ever troubled by your hands sweating so that they feel damp and clammy?
 Often Sometimes Never

- (25) Are you ever troubled by sick headaches?
Often Sometimes Never
- (26) How often are you bothered by having an upset stomach?
Nearly all the time Pretty often Not very much Never
- (27) Are you ever bothered by having nightmares? (Dreams that frighten or upset you very much?)
Many times A few times Never
- (28) Have you ever been troubled by "cold sweats?"
Often A few times Never
- (29) (Not used)
- (30) Do you have loss of appetite?
Often Sometimes Never
- (31) Do you find matter (sleep) in your eyes when you wake up in the morning?
Often Sometimes Never
- (32) When you are tense do you feel that some of your muscles tend to twitch? (note cramps if volunteered).
Never Sometimes Often
- (33) Have you ever been troubled by asthma?
Never Sometimes Often
- (34) Do you feel that you are bothered by all sorts (different kinds) of ailments in different parts of your body?
Often Sometimes Never
- (35) Do you depend on patent medicines?
Often Sometimes Never
- (36) Have you ever been bothered by indigestion?
Never Sometimes Often
- (37) Do you tend to perspire rather easily?
Often Sometimes Never
- (38) Do you ever have pains and a feeling of pressure in your eyes?
Often Sometimes Never
- (39) Are you ever bothered by skin trouble? (Explain if necessary; note KIND if volunteered).
Often Sometimes Never
- (40) Do your arms or legs go to sleep rather easily?
Never Sometimes Often
- (41) Have you ever felt that you were going to have a nervous breakdown?
Often Sometimes Never
- (42) If you have a toothache, do you generally find the pain unbearable? (If subject has dentures, repeat query with before).
Yes Don't know No
- (43) Do you ever feel as if your stomach were burning?
Often Sometimes Never
- (44) Do you suffer from attacks of diarrhea? (in general)
Never Sometimes Often
- (45) Do you ever have a bad taste in your mouth?
Never Sometimes Often
- (46) Do you ever feel a throbbing of pulse in your neck?
Often Sometimes Never
- (47) Are you ever troubled by constipation?
Never Sometimes Often

- (48) Is it difficult for you to get up in the morning?
Often Sometimes Never
- (49) Have you ever been troubled by any aches and pains that seem to come and go? (Space for diseases volunteered; repeat "any aches and pains" with a nod).
Never Sometimes Often
- (50) Does your food ever seem tasteless and hard to swallow?
Never Sometimes Often
- (51) Do you worry about catching diseases?
Never sometimes Often
- (52) Have you ever been troubled with tight feelings in the chest? (Repeat "You know -- tight feelings").
Often Sometimes Never
- (53) Have you ever had any illness or disability where the doctors couldn't help you much? (Note the disability).
Never Sometimes Often
- (54) Do you take many precautions to avoid catching diseases?
Often Sometimes Never
- (55) Did you ever have an old trouble that keeps coming back?
Often Sometimes Never
- (56) Do you tend to lose weight when you have important things bothering you?
No Undecided Yes
- (57) Do you ever get a pain over your heart?
Often Sometimes Never
- (58) Do certain foods upset your digestion?
Often Sometimes Never
- (59) Do you feel your sense of smell is keener than that of most?
Yes Undecided No
- (60) Do you feel it is necessary to take vitamin pills for your health?
Never Sometimes Often
- (61) Do you ever take weak turns? (repeat "you know" weak turns).
Often Sometimes Never
- (62) (a) Do you know what's going on? or (b) Do you lose consciousness altogether?
(a) (b) Both
- (63) Are you ever bothered by buzzing (ringing) in your ears?
Often sometimes Never
- (64) At times do you have a run of little accidents around the house or at your work, breaking things or hurt yourself?
Never sometimes Often
- (65) Do you feel tired in the morning?
Never Sometimes Often
- (66) Do you feel that you are more apt to catch infectious diseases than most people?
Yes Undecided No
- (67) How do you feel about vaccinations?
Compulsory Up to the individual Not necessary
- (68) Have you ever been bothered by any illness that we haven't mentioned yet? (List illnesses volunteered under (a) childhood (b) Serious (c) Operations (d) Accidents).
(b) Serious (c) Operations (d) Accidents).
- (69) Do you feel that when people are ill or in trouble, they can depend on their neighbours for help?
Usually At times Hardly ever

- (70) What do you think of the number of social activities in your community? (a) for adults
Not enough enough Too many
- (71) (b) for children
Too many enough Not enough
- (72) Do you feel like taking part in these activities?
Never Sometimes Often
- (73) To what extent do you enjoy social activities (gatherings?)
Very much Quite well Very little Not at all
- (74) Do you ever feel that some people are trying to pick quarrels or start arguments with you?
Often Sometimes Never
- (75) Do people ask your advice on health matters?
Never Sometimes Often
- (76) Do you feel that people generally tend to exaggerate their illnesses?
Never Sometimes Often
- (77) In general, how did you like your teachers when you were in school?
VL Somewhat VM
- (78) Do you have periods of feeling quite happy, then others of feeling quite blue? (One minute you're up, and the next minute you're down" if necessary).
Never Sometimes Often
- (79) Do you feel that people in your community get the proper food for health?
No Undecided Yes
- (80) Do you look forward to meeting new people? (like to meet new people?)
Hardly ever At times Usually
- (81) Do you feel that young people in your community are generally given a fair deal (fair chances?)
Hardly ever Sometimes Usually
- (82) In general, how well do you feel that older people are respected in your community?
Not enough Enough Very well
- (83) For the most part, do you feel healthy enough to carry out the things that you would like to do?
Usually At times Hardly ever
- (84) Age
- (85) Did you have a pretty fair chance at getting an education?
- (86) What was the last school you attended (ask what kind of school?)
- (87) Have you any trade or special training?
- (88) What was the last grade that you completed?
- (89) (a) You say that you work at- - - . What specific work do you do? (If housewife,
(b) What was your previous employment?
- (90) Compliment.
- (91) Are there any other health problems that people have which you think worthwhile to add to our survey?
- (92) This is all for now; thank you very much for helping us. We have to check on the accuracy of our results at the end of the summer and the way we do this is to return to about ten per cent of the people whom we have interviewed. If you happen to be one of these people, would you mind helping us again? (Yes or no under Name on Answer sheet.).

SCALES

| | | |
|----------------|-----------------|---------------------|
| Excellent | - Health | - Poor |
| Flawless | - Tidiness | - Slovenly |
| Immaculate | - Cleanliness | - Filthy |
| Hyperactive | - Posture | - rigid |
| Excitable | - Excitement | - Depressed |
| Effusive | - Speech | - Monosyllabic |
| Compulsive | - Cooperation | - Hostile |
| Very fast | - Reaction Time | - Very slow |
| Very Attentive | - Concentration | - Easily Distracted |
| Dogmatic | - Decisiveness | - Hesitant |
| Sup (X) | - Assessment | - Jul (Z) |

HOB ANSWER SHEET

| Samp. Code | | Area Code | | Serial Number | | |
|------------|------|-----------|-----|---------------|------|----------|
| From: | Time | To: | Ht. | Wt. | B.P. | Int. in. |
| 1. | | 2. | | | 3. | 4. |
| 5. | | 6. | | | 7. | 8. |
| 9a | | | 37 | | | 68a |
| 9b | | | 38 | | | 68b |
| 9c | | | 39 | | | 69 |
| 9d | | | 40 | | | 70 |
| 10 | | | 41 | | | 71 |
| 11 | | | 42 | | | 72 |
| 12 | | | 43 | | | 73 |
| 13 | | | 44 | | | 74 |
| 14 | | | 45 | | | 75 |
| 15 | | | 46 | | | 76 |
| 16 | | | 47 | | | 77 |
| 17 | | | 48 | | | 78 |
| 18 | | | 49 | | | 79 |
| 19 | | | 50 | | | 80 |
| 20 | | | 51 | | | 81 |
| 21 | | | 52 | | | 82 |
| 22 | | | 53 | | | 83 |
| 23 | | | 54 | | | 84 |
| 24 | | | 55 | | | 85 |
| 25 | | | 56 | | | 86 |
| 26 | | | 57 | | | 87 |
| 27 | | | 58 | | | 88 |
| 28 | | | 59 | | | 89 |
| 29 | | | 60 | | | 90 |
| 30 | | | 61 | | | |
| 31 | | | 62 | | | |
| 32 | | | 63 | | | |
| 33 | | | 64 | | | |
| 34 | | | 65 | | | |
| 35 | | | 66 | | | |
| 36 | | | 67 | | | |

| |
|-------------|
| Health |
| Tidiness |
| Cleanliness |
| Posture |
| Excitement |
| Speech |

| |
|---------------|
| Cooperation |
| Reaction Time |
| Concentration |
| Decisiveness |
| Ties |
| Innervations |

| | | |
|-------|--|--|
| Name: | | |
|-------|--|--|

REMARKS:

The Use of the Discriminant Function in Estimating
The Prevalence of Psychoneurotic
And Related Types of Disorders

by

Garnet E. McCreary¹

Introduction

This report presents a solution to some of the statistical problems which arose in the course of the development of the instrument described in the preceding paper.

In the early phases of the analysis, we ignored the underlying dimensions being tapped by the test items. We assumed that a linear function of the responses could be used to minimize the amount of overlap of the composite score distribution between a

1. The author is indebted to Allister M. Macmillan for permission to use his data and for his many pertinent suggestions in regard to discriminant analysis. Richard Schwartz helped supervise the extensive computations which were carried out with painstaking care by Robert Mendelsohn and Sigrid Topken. The complex punched card tabulations were carried out by Jessie Cohen. The project director, Alexander H. Leighton, provided continued encouragement.

hospitalized psychoneurotic sample and a community sample.

Minimizing the overlap of the scores of two populations, under the conditions fulfilled by our data, can be accomplished by the method of discriminant analysis introduced by Fisher. Certain formulas simplifying the calculations for this method were devised for the equidistant scores on the categories of possible answers to the survey questions. Since these general computational formulas are rather elaborate, the author is not presenting them in this paper. However, even with these simplifications, the computation involved in Fisher's method is still lengthy for hand-computers or for programming on semi-electronic equipment.

Because our own problems required us to restandardize the instrument for several situations, it was felt worthwhile to investigate the possibility of using methods simpler than Fisher's method. In Stirling County we have both a French and English culture and even the English culture is different from the "Good farm" culture of the community criterion group. The whole interview setting was different in Stirling from the test counties (Hants and Kings) in regard to the purpose of the survey, in regard to home interviews as contrasted to private office interviews and in regard to interview methods. In addition, seven of the twenty items used in an original analysis, in which Fisher's method was used without modification, were missing from some of the later surveys. Most important was the fact that, because of other developments in the overall research program, our criterion community group could now be selected on the

basis of a psychiatrically assessed absence of any illness with a psychological component. Additional cases were also available from the hospital group and the Stirling County psychiatric clinic to be added to the comparison psychoneurotic group.

The statistical literature² indicated that several approximation methods which required much fewer computations were almost as precise as full discriminant analysis. The research in this paper was therefore undertaken to shorten our own restandardizations and to enable us to recommend to other investigators (especially researchers in psychiatric epidemiology) working in other societies, or using other items, or in other interview situations, adequate methods for the degree of accuracy which they might require. For data distributed in a manner similar to our original data, the conclusions and recommendations of this paper, as it turned out, are considerably different from the conclusions of other authors on this subject.

Nine methods (eight of them approximations) were compared using the survey data of the preceding paper. An assessment was made, based on several factors of the relative merits of each method. These factors are listed below.

An estimate was made of the amount of computation involved in each method. The error of each method was measured in terms of both false positives and false negatives (Type I and Type II errors) at various cutting points. The various approximations were compared as to their ability to separate the community mean from the hospital

2. For example: Beall, G. "Approximate Methods in Calculating Discriminant Functions". Psychometrika 1945, Vol. 10, pp.205-217.

psychoneurotic mean relative to the average amount of variation around each mean. The worth of the method was also measured in terms of the ability of the approximations to distinguish between areas with varying percentages of false positives and false negatives.

Although full discriminant analysis requires a considerable amount of work it is also the method which is most valid and free from error. If one requires somewhat less reliability and validity, then one particular approximation which requires less work stands out from the rest. If one requires only minimum precision and accuracy, then another approximation which requires little work can be recommended more highly than the others. Any investigator with similarly distributed data would find this report useful to him in choosing the method which is best suited to his precision, accuracy and computing restrictions.

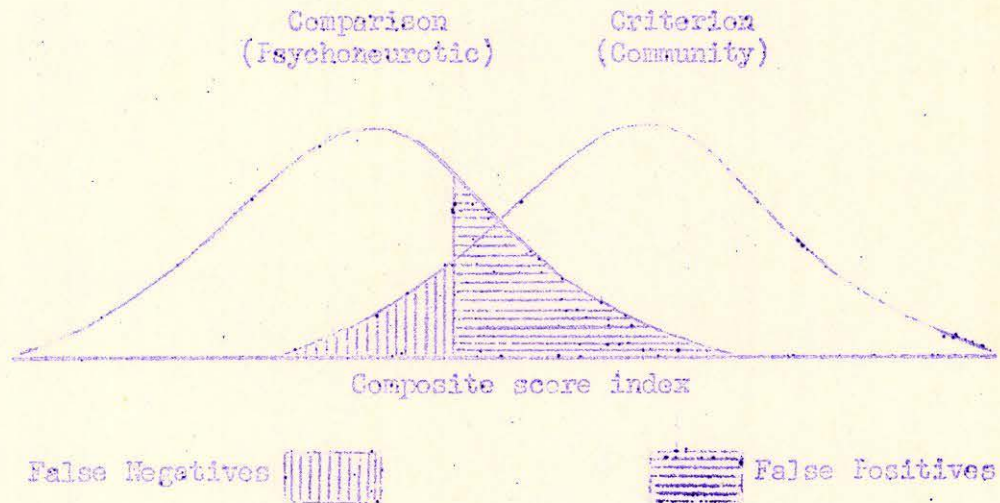
The Problem

Approximately seventy trichotomous questions pertinent to the respondent's mental health had been administered to 612 community people (559 white) and to 200 patients in hospitals and the province. serving a metropolitan area/ Seventy-eight of these patients were diagnosed psychoneurotics.

To varying degrees for each question, the distribution of answers on the categories of reply for the community samples³ and

3. The non-institutional samples consisted of people living in various ecological areas of two contiguous counties, Hants and Kings, of the Maritime Provinces of Canada.

Fisherian discriminant analysis gives a weight factor to each of the items, so that distribution of scores for the composite index overlap⁹ minimally for the criterion group and the comparison group. In our case, this procedure would thus result in the smallest possible proportion in the hospital group being classed as "well" or the smallest possible proportion of the community group being classed as "sick" or both. Full analysis requires, in this case, the calculation of a 20 x 20 matrix of the correlations between items, then inversion of this 20 x 20 matrix in order to solve for the item weights. These computations are exceedingly lengthy on



Frequency Distributions for a Criterion Population and a Comparison Population.

9. More precisely discriminant analysis gives the weights for each variable in a linear additive model such that the means of the composite scores for the two criterion groups are pulled as far apart as possible, subject to the condition that the average of the variances of the composite score around each group mean remain as small as possible. We amplify our discussion of discriminant analysis on page 84.

hand calculators and require considerable time and effort to program for a semi-electronic calculator. There were indications in the literature¹⁰ that certain approximations could be used in place of this long exact solution without increasing the error (either false positives or false negatives) a great deal.

We tried eight of these approximations using the same data we had used for the full Fisherian discriminant analysis. However, with this data, none seemed as powerful as the full analysis in reducing error, as previous authors had indicated.

Approximations I through IV

In the following paragraphs, we will discuss each approximation in turn, more or less as they rank order themselves from shortest to longest, and most difficult to compute.

The j th respondent's score on the k th item we will call his x -score (algebraically x_{kj}). The j th respondent's score as the composite index¹¹ of all items we will denote as his y -score (algebraically y_j). Since there are two groups we will denote them by the subscript i . When $i = 1$ we are referring to a respondent in the community and when $i = 2$ we are referring to a respondent in the hospital. The number of respondents in the community sample we denote by n_1 and in the hospital sample by n_2 .

10. Beall, G. op. cit., also, Horst, P. and Smith, S. "The Discrimination of Two Racial Samples". Psychometrika, 1950, Vol. 15, pp. 271-289.

11. In this paper, space does not permit an elaboration of the pros and cons of using a linear additive model for these calculations.

Approximation I. The easiest, most obvious method of obtaining the composite score for a respondent (the y-score) and the one most likely to be used, is the method of giving each item the same weight. Algebraically it may be expressed as:

$$y_{ij} = \sum_{k=1}^{20} x_{kij}$$

$n_1 = 140, n_2 = 78$
 $x_k = 0, 1, \text{ or } 2$
 $k = 1, 2, \dots, 20$ [1]
 $i = 1, 2$
 $j = 1, 2, \dots, n_i$

and the Fisherian discriminant analysis. The remaining seven approximations/will only differ in how the item weights, (λ_k) ¹² are defined.

If some items are more important than others, this implies that we have a different weight (λ_k) for each of the k items. We can represent this composite score algebraically by:

$$y_{ij} = \sum_{k=1}^{20} \lambda_k x_{kij}$$

[2]

Approximation II. In this case, the weights for each item are determined on the basis of the difference in the distributions of the criterion sample and the comparison sample for that item.

12. Note: for approximation I, $\lambda_k = 1$ for every item.

There are several different ways of measuring the difference in distributions, but the one that we used was based on differences at both ends of the item scale.

Approximation III. If we assume pairwise statistical independence of the items and determine the weights (λ 's) of the items which lead to a minimization of overlap of the distributions, then the weights are proportional to the difference in the means of each item standardized against the standard deviation.

Algebraically¹³ this is expressed as:

$$\lambda_k = \frac{c(\bar{x}_{k1} - \bar{x}_{k2})}{s_k} \quad [3]$$

where, \bar{x}_{k1} - mean of the community sample on item k
 \bar{x}_{k2} - mean of the psychoneurotic sample on item k
 s_k - the standard deviation for item k
c - a constant.

Thus these weights take into account the differences in each of the distributions, as far as the means reflect it, and standardize them against the relative average amount that the item scores deviate from their means.

Approximation IV. Beall¹⁴ reported adequate results if he assumed perfect correlation between the items. He determined the

13. The method of weighting is equivalent to the "difference method". See Young, Pauline: Scientific Social Surveys. N. Y.: Prentice Hall. 1949. Chapter XIV. "Scaling Techniques in Sociological Research" by C. F. Schmid: pp. 348-382. The standard deviation in this case is based on the average variation around the group mean for each distribution.

14. Beall, op.cit.

weight (λ 's) by minimizing the amount of overlap between the distributions. When we applied his approximation formula to our data there was virtually complete overlap of the distributions on the scale of the composite index. Further investigation of the mathematics in Beall's paper led to the discovery that actually the true solution for the weights was indeterminate for any data. However, we did compute his incorrect solution.

Further Approximations

Since further approximations are based on operations with the intercorrelations between items, it seems appropriate at this point to introduce the matrix of intercorrelations. Each element of the matrix represents the correlation of a certain item with another item. The diagonal elements represent the correlation of each item with itself (which is, of course, unity). Since the matrix is symmetric, we will indicate only the part above the diagonal.

$$R = \begin{pmatrix} 1 & r_{1,2} & r_{1,3} & \dots & r_{1,20} \\ & 1 & r_{2,3} & \dots & r_{2,20} \\ & & 1 & \dots & r_{3,20} \\ & & & \dots & \vdots \\ & & & & \vdots \\ & & & & r_{19,20} \\ & & & & 1 \end{pmatrix}$$

4

All of the approximations listed below are based on separating the means of the distributions of a composite index as far as possible, subject to the condition that the dispersion around each group mean remain as small as possible. This is true of course for the full discriminant analysis. The approximations, have, in addition, certain further restrictions placed on them.

Approximations V, VI and VII. The three following approximations make the restriction that one can estimate all the individual correlations by a single weighted correlation coefficient.

The formula for the weighted correlation coefficient for approximation V is the weighted average of all the pairwise inter-correlations where the weights are the standard deviations associated with each item of the questionnaire.

Approximation VI has the same form except that the pairwise correlations are based on all $(n_1 + n_2)$ subjects without regard to the population to which they belong.

Approximation VII assumes a single estimate of the correlation coefficient between items, but places no restrictions on the formula for the estimate as do the previous approximations. In all three cases above, the single estimated correlation coefficient is substituted in a certain formula¹⁵.

Approximation VIII. The method which ranks next, as far as complexity of computations are concerned, is the Horst-Smith¹⁶

15. Beall, op. cit., p. 207. Formula (14)

16. Horst-Smith, op. cit.

method, or approximation VIII. It is actually a method in which the items are dealt with sequentially. The model is a multiple linear regression in which the dependent variable is a dichotomy. Each time, after a new item is added to the multiple regression, the multiple correlation coefficient is calculated. This measures the proportion of total variance that has been accounted for by the items already entered. The process is stopped when the reduction in the multiple correlation coefficient becomes negligible. This usually occurs before all items have been used in the sequential process, so that some items will have zero weights. Like Approximation VI the item standard deviations and intercorrelations (except the point bi-serial) ignore the fact that the subjects come from two different populations.

Fisherian Discriminant Analysis

We have previously indicated some of the characteristics of Fisherian discriminant analysis. Here we must add some further observations. Fisherian discriminant analysis also uses the linear or additive model for combining item scores. It determines weights which maximize the squared distance between the means of the two distributions on the composite scale, subject to the condition that average variance within the two groups remain as small as possible. The weights which achieve this maximum are given, in the case of our data, by twenty simultaneous linear equations which can be expressed in matrix notation as

$$(R) (\vec{w})' = (\bar{X})'$$

[5]

where R is given by expression $[4]$, (\bar{w}) is a row vector giving the weights for each of the twenty items, (\bar{X}) is a row vector giving the difference between the mean scores of the two groups for each item. In order to solve for the item weights, it is necessary to invert the (R) matrix. As we mentioned earlier, computation by hand calculator is lengthy and programming for semi-electronic computing machines laborious.

Item Weights

Up to and including approximation III there are easy and common sense explanations for the size of the weights. For later approximations and full discriminant analysis it becomes increasingly more difficult to get a clear picture of why the relative sizes of item weights turn out to be what they are. One reason for this is that the intercorrelations among the items enter the picture in an increasingly complex way as we proceed from one approximation to the next.

For instance, in the case of the Horst-Smith method the items are taken sequentially according to which one has the highest ranking point bi-serial coefficient with the dichotomous dependent variable, after the fitting of the previous items. Consequently, the contribution of any particular item to the reduction of total variance may have already been given by previous items. Some item weights turn out to be negative. This also happens with full discriminant analysis. It must be remembered that the matrix of intercorrelations consists of 190 elements of varying sizes and

that some are negative. In order to achieve the maximum discrimination between the two populations there are many interconnected "pulls and strains" which result in one or two negative weights (λ 's).

Comparison of Results

In this section, we will compare the various approximations with each other and with Fisherian discriminant analysis, using our data. It is very interesting that our conclusions regarding the efficiencies of the various methods differ considerably from those of Beall¹⁷, using the data available to him. There are at least two explanations for this difference:

(1) Our data, variable by variable, are differently distributed from Beall's data, variable by variable.

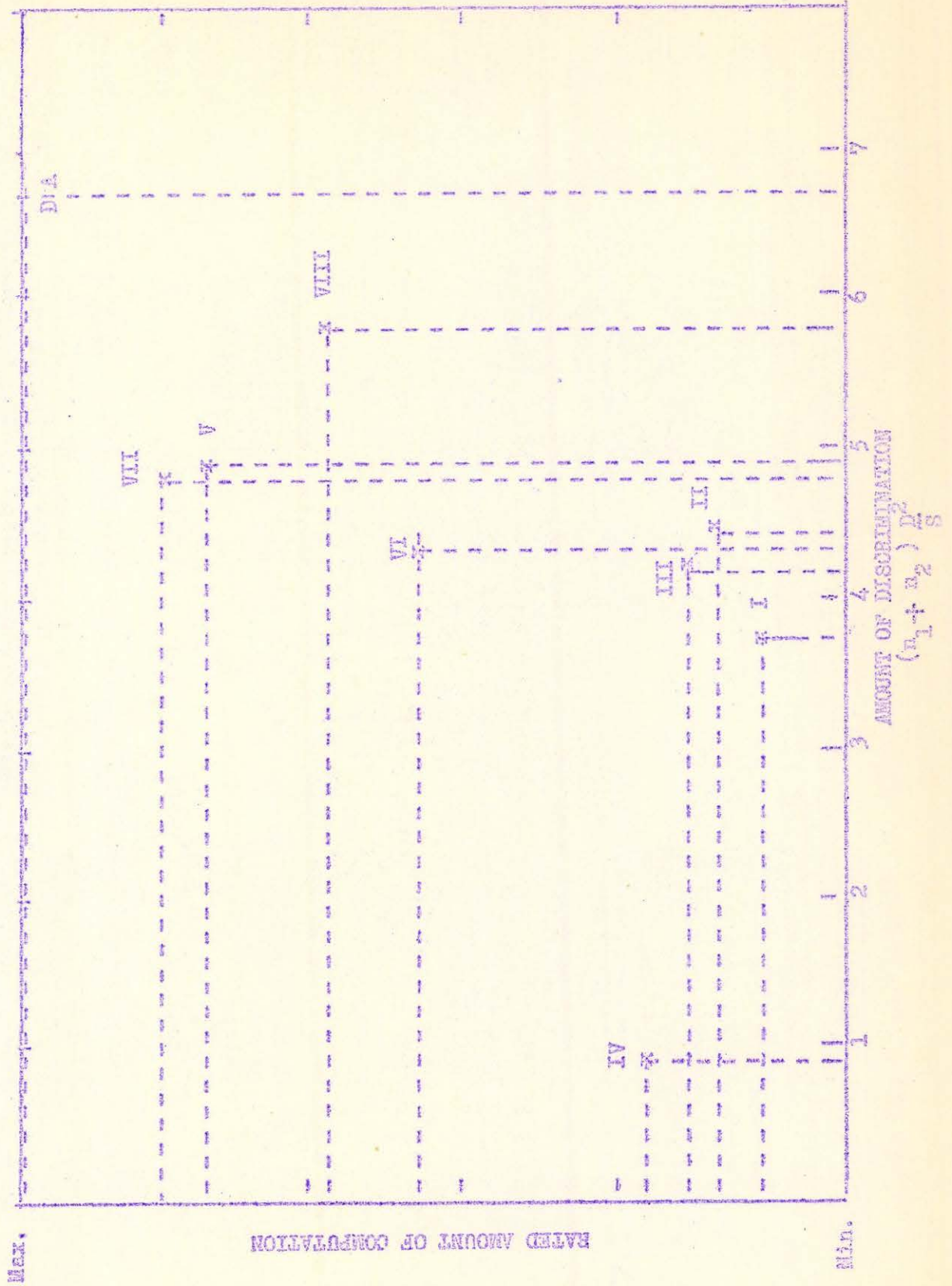
(2) The maximum number of variables used by Beall in any of his data was considerably smaller than the twenty we used.

In a relatively short non-technical paper it is possible to present only a few of the more important tables which are needed to give a full picture of the results. Thus only summary tables and graphs are presented and the explanation of these graphs and tables is necessarily terse. It is hoped that the reader will be able to follow the text which accompanies each graph or table. Graph I follows on the next page.

17. Beall, op. cit.

Gra pñ 1.

Amount of Computation and Amount of Discrimination



In Graph I we have plotted the amount of computation on the vertical axis, and on the horizontal axis we have $(n_1 + n_2) \frac{D^2}{S}$ for each approximation and for full discriminant analysis. The amount of computation is the author's estimate on the basis of supervision of the operation. $(n_1 + n_2) \frac{D^2}{S}$ is the square of the distance between the group means of the composite index for each method, standardized against the average variance around each group mean. Hence $(n_1 + n_2) \frac{D^2}{S}$ is a good overall measure of overlap, which is independent of the location of the cutting point. It is a perfect measure of overlap if the two distributions on the composite index scale are normal. For our purposes at any chosen cutting point we would like to have a minimum number of false positives and false negatives in order to have a statistically more accurate instrument. Hence the importance of each extra unit of discrimination increases more rapidly than the scale at the bottom of the graph would indicate.

In Table I, on the following page, the various methods are compared when a cutting line is established at a fixed point on the composite scale axis. In this case, the cutting point was established for every approximation method at the point where eight per cent of the hospital psychoneurotics were misclassified. Once this cutting point is established, one can estimate the percentage of psychoneurotics among community people for each method, in turn. The entries in the table represent not only a fixed proportion of true negatives in the community population, but also a varying proportion of false negatives according to the method used. A fair

statement to make under these circumstances is that the lower the percentage in either column, the better the method. In general the methods would arrange themselves in the rank-order given, not only for the 8 per cent cutting point, but for any other reasonable cutting point.

Table 1

Comparison of Methods Holding False Positive Pa's at 8%

| Method | % Estimated "sick" | |
|-----------|--------------------|-----------|
| | Good Farm | H-K White |
| Full D.A. | 12 | 25 |
| VIII | 21 | 28 |
| VI | 24 | 30 |
| V | 25 | 30 |
| VII | 32 | 34 |
| III | 34 | 36 |
| II | 34 | 35 |
| I | 35 | 36 |
| IV | 70 | 75 |

It is clear from Table 1 that full discriminant analysis is by far the best discriminator for the "Good farm" group of people¹⁸. When the weights for the items and a cutting point have been determined, it is then possible to estimate the proportion of psychoneurotics for a relatively similar population, interviewed under

¹⁸. In each method the good-farm group was used as the criterion "well" group.

similar circumstances. The "H-K white" group represents a sample drawn from a two-county area of which the "Good farm" area is a part. Anthropological observation indicates that the percentage of true negatives is considerably greater for the H-K sample than it is for the "Good farm" sample. Hence it appears that full discriminant analysis would give the most reliable relative¹⁹ proportions of psychoneurotics for different areas. Approximation I, since it gives equal weight to all items, establishes the fact that the marginals are about the same, on the average, for the good-farm group as for the H-K sample. However, it is almost certain from psychological theory that some items are more important than others in distinguishing which people are psychoneurotic and which people are not. Approximation IV has already been ruled out in an earlier section of this paper because it was mathematically incorrect.

Table 2, on the next page, differs from Table 1 in that a variable cutting point for each approximation method is used. The assumption is made that there are roughly 10 per cent true negatives in the criterion "Good Farm" group. A further assumption is that when we misclassify a certain number of "well" community people, we misclassify an equal number of hospital psychoneurotics. The smaller the percentage of false positives or false negatives, the better the method. Fisherian discriminant analysis produces the least error.

19. It is the relative proportions for various ecological areas that are important in this context. The absolute proportions can be established by an outside criterion as this paper describes later on.

Table 2

Comparison of Methods Allowing Percentage of False Positives To Equal Percentage of False Negatives, with Percentage of True Negatives Held Constant for Good Farm

| Methods | Cutting Point | False Positives or Negatives | True Negatives | |
|-----------|---------------|------------------------------|----------------|-----------|
| | | | Good Farm | H-K White |
| Full D.A. | 62.95 | 5% | 10% | 22% |
| VIII | 26.45 | 10 | 9 | 17 |
| VI | 34.95 | 10 | 11 | 19 |
| V | 37.95 | 10 | 10 | 19 |
| VII | 39.95 | 13 | 9 | 15 |
| II | 104.95 | 13 | 9 | 12 |
| III | 40.95 | 14 | 10 | 12 |
| I | 26.95 | 14 | 9 | 11 |

The last column of the table indicates that the estimate of the percentage of true negatives among the H-K sample is highest for full discriminant analysis. This agrees with the survey team's impression of the whole two-county area. The same inferences would hold in general had any other percentage of true negatives been chosen to determine the cutting point. While it appears from this table that approximations V, VI and VIII are equally good, for practically all other cutting points, VIII is superior to V and VI. In general, approximation II does as well as approximation III both of which are, in turn, superior to approximation I.

Thus far, the methods have been compared mainly in regard to their reliability. Although it will be impossible in this paper to present detailed tables showing the degree of validity which each approximate method achieved, the author is presenting here a rough outline of the nature of the validity test.

Sixty-four respondents from the original 559 were re-interviewed on the original questionnaire and in addition were given an hour's physical and psychiatric evaluation by a well-trained psychiatrist. The 64 recheck interviewees were scattered along a fairly long axis linking the polar extremes of "sick" and "well". The psychiatrist assessed the respondent's position on a five-point rating which indicated "degree of need for treatment" or "illness-wellness"²⁰. He subjectively evaluated his error of placements at about 15 per cent.

Hence the outside criterion of validity is the psychiatrist's evaluation of illness-wellness. If one establishes a fixed cutting point, then all respondents who have a score on the composite index larger than that of the cutting point score will be classed as "well", and all those with scores below the cutting point will be classed as "sick". If the statistical method is to have high validity, there should be a high correlation between the psychiatric classification and the statistical classification. The middle category, No. 3, of the psychiatric classification contains twenty-three respondents. It cannot be used as part of the validity check since it belongs to

20. The psychiatrist also labeled the respondents with an appropriate diagnostic category unless the person was classed as "well".

neither side of the illness-wellness dichotomy. The statistical method does, of course, classify some of them as "well" and some of them as "sick". In categories 4 and 5 of the psychiatric classification, there are altogether only twelve cases, so that it is rather difficult to compare approximation methods for this part of the psychiatric classification. Eight per cent false-positive psychoneurotics was the cutting point used in the validity check of the full discriminant analysis and the approximations as well.

Table 3, below, is an example for the case of full discriminant analysis. It illustrates some of the detail involved in making a validity check for any approximation method. Entries in the table are actual numbers of respondents, not percentages.

Table 3

Comparison of Full Discriminant Analysis Classification
With Psychiatric Evaluation Classification

| Psychiatric Rating | | Statistical Classification | | |
|--------------------|----------|----------------------------|--------|-------|
| Rating | Category | "Well" | "Sick" | Total |
| 1 | "Well" | 16 | 1 | 17 |
| 2 | "Well" | 9 | 3 | 12 |
| Total "Well" | | 25 | 4 | 29 |
| 4 | "Sick" | 3 | 5 | 8 |
| 5 | "Sick" | 0 | 4 | 4 |
| Total "Sick" | | 3 | 9 | 12 |

We are well aware that the statistical classification is subject to numerous errors²¹; i.e., interview errors, false negative errors, etc. In evaluating the validity of each approximation, it was necessary to take into account how far distant the statistical scores of non-agreement respondents were from the cutting point and what were the diagnostic categories.

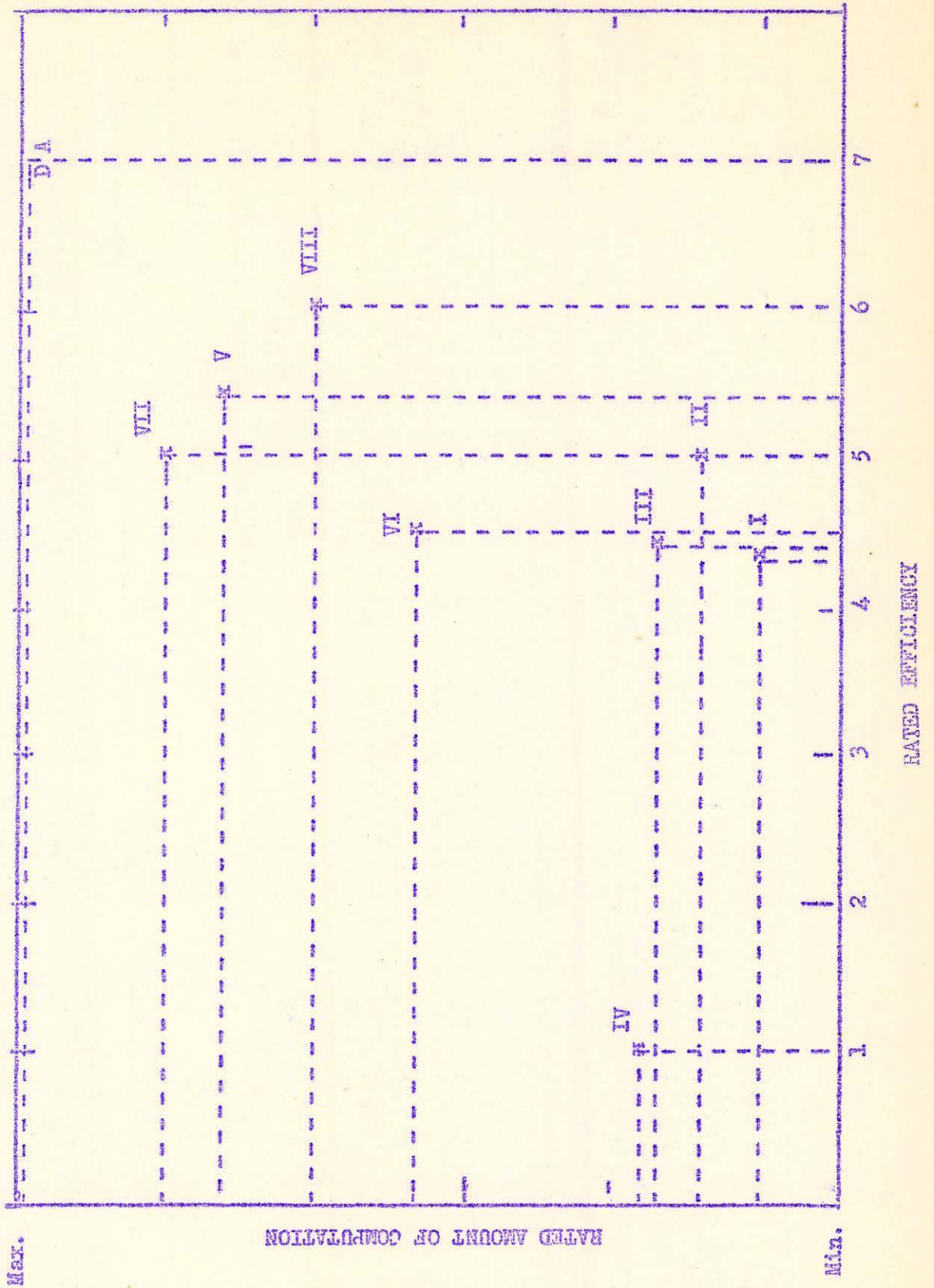
Respondents in psychiatric classifications I and V should have scores farther from the cutting point than those with ratings II or IV. We conclude that full discriminant analysis and approximation VIII are more valid than the other methods. Because of the small numbers one cannot decide between full discriminant analysis and approximation VIII nor can one rank order the other approximations.

Graph II, on the following page, is a summary graph relating amount of computation to the efficiencies of full discriminant analysis and the various approximations. The concept of efficiency, as used here, is a very general one, which includes reliability as well as validity. The evaluation of efficiency is a subjective estimate on the author's part, but is based on several measures²² of reliability and validity. The vertical axis of Graph II is identical with that of Graph I. It represents an estimate of the amounts of computation involved in each method. The horizontal axis represents a scale of efficiency.

21. "Error" is not used in the sense of mistakes in computation. As far as possible, this type of error has been eliminated.

22. These measures are: (a) amount of overlap of the two criterion distributions at various cutting points on the composite scale; (b) difference in estimated proportion of true negatives between "Good farm" and "H-K whites" at various cutting points; (c) validity of the method as judged by the psychiatric rating of 64 recheck respondents.

Graph 2.
Amount of Computation and Efficiency



For our purposes the farther to the right and the closer to the horizontal axis, the better the method. These two criteria of "goodness" of a method do not pick out one single method as best. However, it would appear that full discriminant analysis is best where the greatest efficiency is required. If a medium efficiency is required, then approximation VIII (Horst-Smith) is best. The best of the least efficient methods is approximation II (marginal differences).

Conclusions

General conclusions regarding this analysis of methods are subject to a number of qualifications. One is that these results hold²³ only for data whose multivariate distributions are similar to those of our data.

With respect to psychiatric epidemiology, the following points must be kept in mind. The presence of true negatives in the criterion community group certainly affects the conclusions to some extent. The "sick" people in the community not only include psychoneurotics, but also, in addition, sociopathic personalities, psychotics, people with psychophysiological complaints, and people with personality problems. On the statistical side, the twenty questionnaire items tap several syndromes, facets and dimensions of mental disorder. However, the twenty items have been combined in a linear model which probably does violence to psychiatric fact. In effect, we are trying to maximize the distance between the

23. For example, Beall, op. cit., comes out with different recommendations for the type of data with which he deals.

community people, who to a limited extent have a variety of syndromes, and a psychoneurotic population, without taking into consideration the syndromes that are being tapped. In fact, the methods aim to maximize the distance, as far as possible, on all underlying dimensions at once.

The indicators of reliability and validity, despite the fact that they themselves are subject to a small amount of error, all point to the conclusions which follow:

If one has carefully collected data of this type and if accuracy in predicting proportions of psychoneurotics for various ecological areas is important, then:

- (a) Fisherian discriminant analysis is the best method, even though it requires elaborate computations;
- (b) Approximation VIII (Horst-Smith) is second best with a medium amount of computations;
- (c) Approximation II (marginal difference method) may be used and requires very little computation.

Even more generally, the author believes that in many cases where data are carefully collected, where one does have some theoretical knowledge that the model is not too far wrong, it does pay to carry out fairly elaborate computations. Had we, for instance, relied on a less accurate method using equal weights on these twenty items, then one ecological area would be indistinguishable from another, even though there was in fact a large difference in the true proportion of cases in the two areas.

A Guttman Scale for Estimating Differential
Levels of Living in Rural Populations

by

Marc-Adelard Tremblay¹

Introduction

There is much in the literature which points to poverty, especially extreme poverty, as a factor related to prevalence of mental disorders. The relationships between the two are not, however, clear or firmly established². The subject of this paper, a Guttman scale for estimating differential levels of living³, is one

1. While the author wrote the later drafts of this paper, the development of this research instrument has been the work of a number of people. Credit should be given to Jessie Cohen, Charles C. Hughes, Alexander H. Leighton, Allister M. Macmillan, Seymour Parker, Robert N. Rapoport and Richard Schwartz. Garnet E. McCreary, the Project Statistician, provided assistance at various stages of the work.

2. Faris & Dunham, op. cit.; and Hollingshead & Redlich, op. cit.

3. As far as we are aware, this attempt to describe a dimension of socio-economic status in this form represents a new application of Guttman scaling. It has implications, obviously, outside of preventive psychiatry with which we are mainly concerned in Stirling. Its significance for public health administration in general, and mental health in particular, is a question of the degree to which poverty has significance in the distribution of mental illnesses.

of a number of research instruments which, we hope, will help clarify these relationships.

The scale described in this paper was developed in the course of our studies of poverty and affluence as related to social disorganization⁴. It is constructed from part of a larger body of data collected for the purpose of placing individuals, as well as communities, along a poverty-affluence continuum. The scale for measuring levels of living is based primarily on material household possessions which reflect, to a large extent, the family "style of life". In addition to the scale we have indices more directly related to economic opportunities, such as type of occupation, length of time in a given occupation (named occupation stability index), unemployment, etc. In this presentation we are dealing with only one of several interrelated aspects of poverty-affluence.

Characteristic of a Guttman Scale

One of the essential characteristics of a Guttman scale⁵ is that it can occur only when the phenomenon under study is unidimensional. Another feature is that it rank orders⁶ individuals

4. See Leighton, op. cit.

5. The Guttman scale is usually called "the scalogram method", "scale analysis", or "scalogram analysis". See Stouffer, S. A., et al., Measurement and Prediction, Vol. IV., Studies in Social Psychology in World War II, Princeton, 1950. Also: Jahoda, Marie; Deutch, M.; and Cook, S.W. Research Methods in Social Relations, N. Y.: Dryden Press, 1951, pp. 198-202, and 682-691.

6. This implies an ordinal scale. See Jahoda, et. al., op. cit., p. 121. The rank ordering of either items or individuals, while quite definite and reliable, gives no indication of the "distance" between any two points of the scale. In other words, the intervals are not necessarily equidistant and the only statements that can be made are in terms of "more", "as much" or "less" without specifying how much more or how much less.

with empirical consistency. Finally, of equal importance, is the fact that the items have a cumulative quality. In a perfect scale, if an individual possesses the item which has the highest discriminatory capacity, he will have also all the other items which rank below it. This will be illustrated when the content of the scale is presented.

In brief, when the scale analysis method is applied to a group of items (usually with dichotomous categories) it will distinguish those which belong to the same dimension from those which do not. Since it is seldom known in advance, however, whether a given sociological or psychological group of separate entities belongs to the same dimension within a "universe of content" or "universe of attributes", it is necessary to search for Guttman Scales.

Generally, a scale is a more reliable instrument than one based on indices where arbitrary weights are assigned to items on the basis of their probable importance to the whole. Thus if a Guttman scale can be discovered, it offers reasonably greater confidence in regard to the control over the phenomenon observed than would be the case with some other measurement techniques currently in use in the social science field.

Content of the Levels of Living Scale

In its final form the scale is based on eight indicators⁷ of levels of living⁸, five of which are taken from responses to questions on the Family Life Survey⁹, two, from interviewer ratings,

7. cf.: Hagood, Margaret J., Farm Operator Family Level of Living Indexes for Counties of the United States, 1940 and 1945, Washington: Bureau of Agricultural Economics (mimeo.) 1947; Chapin, S. F. The Measurement of Social Status. Minneapolis: University of Minnesota Press, 1938; McKain, W. C., Jr. "The Concept of Plane of Living and the Construction of a Plane of Living Index". Rural Sociology, 1939, Vol. 4, (3), pp. 336-342; Perry, C.A. "A Measure of the Manner of Living". J. Am. Statist. Ass., 1912-13, Vol. 13, pp. 398-403; Sewell, W.H. "The Construction and Standardization of a Scale for the Measurement of the Socio-Economic Status of Oklahoma Farm Families". Stillwater: Oklahoma Agricultural and Mechanical College, Agricultural Experimental Station, Technical Bulletin No.9, 1940; and Sydenstricker, E. and King, W.I. "The measurement of the Relative Economic Status of Families". J. Am. Statist. Ass., Vol. 17, pp. 842-857.

8. Despite the fact that some studies have indicated that it was possible to ask for and get valid income information by asking the respondent to place himself in one of several income classes, it was felt by all anthropological field workers that such a procedure in Stirling would be inapplicable in terms of our long-range goals (which include keeping the best public relations possible), and in terms of the questionable reliability of such elicited responses. It is a very common phenomenon in western cultures that people resist telling outsiders their real income. The main reasons which account for this resistance have to do with the consequences that such a disclosure may have (increased income taxes, loss in credit power). Some respondents doubt that the confidentiality of the material can be respected; others simply think that it is none of the interviewer's business. For these and other reasons, people frequently hesitate to reveal their annual income. Among those who do reveal it an important number will unconsciously give wrong figures, or purposely distort their earnings in order either to gain prestige (boosting) or to avoid possible repercussions (reducing). These were the methodological reasons justifying our choice of indicators of levels of living instead of other measures of economic well-being that have been formulated in the literature (see above).

9. The Family Life Survey (FLS), by means of a questionnaire, was conducted in Stirling County during the summer months of 1952 and included a total of 1,015 households which were selected on a random systematic basis.

and one, a combination of interviewer ratings and questionnaire responses.

The responses to the following FLS questions comprise the basis for five of the scale items:

- 193: "How is your house lighted?"¹⁰
1. electricity
 2. oil or kerosene lamps
 3. other (specify)
- 194: "How do you keep your food?"
1. cold room or basement
 2. outside room or pit
 3. ice
 4. electrical refrigerator
 5. other (specify)
 6. no special way
- 195: "How do you wash your clothes?"
1. tub
 2. washing machine (electrical)
 3. washing machine (other kind-specify)
 4. send it out to be washed
 5. other (specify)
- 196: "What kind of toilet do you have?"
1. outdoor
 2. chemical
 3. flush
- 197: "How do you heat your house?"
1. furnace
 2. stove
 3. other (specify)

The responses to these questions are clear and unambiguous and the greatest number of non-responses to any one question was only nine, out of the total of one thousand and fifteen respondents. It was

10. It might be of interest to the reader to learn that the following items did not conform to the scalogram pattern: car ownership, the carrying of life insurance, woman of the house working, house ownership and subscription to magazines. This seems to mean that these items were not completely on the same continuum as those belonging to the scale which we named "levels of living". From a content analysis point of view, they seem to reflect prestige position, levels of aspirations, etc.

possible to dichotomize the responses, thus suggesting the cutting points for scaling, which were established where the least scale errors existed. The category of responses which represents a wealth indicator is assigned a plus sign and the category which represents its absence receives a minus sign. This dichotomization is illustrated later.

In addition to the five household items, three others of somewhat more complicated structure are included. These factors, even though they are not directly related to material possessions, also pertain to certain characteristics of the household. They are the following: (a) the quality of interior furnishings (b) house type and (c) room-person index. The ways in which these items were derived and scaled will be described briefly below.

a. Quality of Interior Furnishings. Interviewers rated the quality of each of three aspects of interiors (wall paper, floor coverings and furniture) as being poor (weight of 1), average (weight of 2) and superior (weight of 3). Thus a household would obtain a rating on this item which varied from a minimum of 3 to a maximum of 9. Specific instructions were given to all interviewers¹¹ in order to insure that criteria for rating meant the same thing to

11. Most interviewers had advanced training (graduate) in social sciences and some of them had doctoral degrees. I wish to express my indebtedness to their contribution. The complete list of those who worked on the questionnaire survey is: Alphonse Deveau, Gerald and Therese Fortin, Emile Gosselin, Charles and Jane Hughes, Allister Macmillan, Garnet and Ann McCreary, Elizabeth Marsh, Seymour and Hilda Parker, Robert Rapoport, Janice Ross, John and Carolyn Winget, and the author.

all. Undoubtedly, there were some variations in interviewers' interpretation of these. Such variations, however, are minimized by the fact that, for analytical purposes, the only distinction made was between houses with a score of eight or nine (given a plus sign) and those with a score below eight (given a minus sign). Thus, in order for a sampled household to receive a plus sign on the quality of interior furnishings item, it must be rated as being superior on at least two of the furnishings and average on the remaining one. One can expect considerable agreement among interviewers as to what, in general, constituted superior quality of interior furnishings. As it turned out, this item had the highest rank order and only those households which reflected high levels of living rated positively on this item.

b. House Type. This scale item was also based on observational criteria. Interviewers rated houses on four separate characteristics: size, condition of the roofing, condition of walls and foundations, and the condition of the yard and outbuildings. Like the former observational composite item, each separate criterion had a trichotomous rating of poor, average, or superior with respective weights of 1, 2, and 3. The minimal and maximal scores were 4 and 12. A score of seven and above indicated the presence of a wealth indicator, and received a plus sign.

c. Room=Person Index. This item represents an attempt to construct an index of the living space available to a household in relation to the number of persons it contains. Three criteria were used for arriving at the room=person index: (a) the size of

the house as rated by the interviewer (small, medium, large); (b) the number of rooms as given by the respondent; and (c) the number of persons living in the household at the time of the survey, and their respective ages.

The formula for the room-person index is:

$$\frac{\text{adjusted number of rooms}}{\text{adjusted number of persons.}}$$

The adjusted number of rooms is derived in the following manner: all houses that receive a "small" rating for size have their number of rooms divided by two. Rooms in medium and large houses were counted at full value. The adjusted number of persons was derived as follows. Individuals fourteen years old and above were considered as adult. Children aged 6-13 counted for one-half adult and those younger counted as one-fourth. A rating of two or more resulted in a plus sign; less than two, a minus.

The order of the eight items, in the scalogram model, indicates that the possession of a level of living attribute for any particular item implies the possession of any item ranked below it. The scale order of items from high to low is: (1) interior furnishings, (2) heating facilities, (3) food refrigeration, (4) toilet facilities, (5) room-person index, (6) clothes washing, (7) house type, and (8) lighting.

Ideally, households could be rank ordered according to their ratings on the preceding items in the following manner. A household with a favorable rating (plus sign) on quality of interior furnishings would be ranked higher than a household with

an unfavorable rating (minus sign) on the same item. In addition a household rated favorably on this item would be ranked highest on the scale of living and would have favorable ratings on all succeeding seven items. This is what is meant by the cumulative property of the items in the scale analysis method. Similarly, a household rated unfavorably on the last item (lighting facilities) would be ranked lowest on the scale of levels of living and would have had unfavorable ratings on all preceding seven items.

Actually few Guttman scales achieve this ideal of reproduction of ratings. However, where the ideal is approximated closely enough¹² the data can be accepted as constituting, for all practical purposes, a Guttman scale.

Results of Scalogram Analysis of the Eight Items

Table 1, which follows on the next page, presents the distribution of positive and negative signs for the county as a whole.

12. Judged by the coefficient of reproducibility and scalability.
See p. 109

Table 1

Distribution of Positive and Negative Signs on the
Eight Items Conformings to the Scalogram Pattern,
1,015 Respondents

| Scale Items (from high to low) | Dichotomization | Number of Households |
|-----------------------------------|--|-------------------------|
| 1. Furnishings | Score of 8 or 9 on a three point rating based on three characteristics (wall paper, floor coverings, furniture)..... | 114 |
| | Score of 3-7 and Rejects. | |
| 2. Heating Facilities | Furnace..... | 269 |
| | Stove, other, FA, NA. | |
| 3. Food Refrigeration | Refrigerator..... | 298 |
| | Pit, cold room, basement, ice other and no special means. | |
| 4. Toilet Facilities | Flush toilet..... | 344 |
| | Chemical, outdoor, none, NA. | |
| 5. Room-Person Index | Two rooms or more per person..... | 517 |
| | Less than two rooms per person. | |
| 6. Clothes washing | Washing machine, electrical, send out. | 700 |
| | Tub, others, NA. | |
| 7. House-type | Score 7-12 on a three point rating on four characteristics (size, roof- ing, walls and foundations, yard and outbuildings)..... | 754 |
| | Score of 4-6 | |
| 8. Lighting facilities | Electricity..... | 857 |
| | Kerosene, Other, NA. | |

FA indicates "respondent failed to answer"; NA, "question was not asked".

The table gives general information as to the total number of households which have a favorable response to any particular indicator of level of living. It says, for instance, that 857 households have electricity, that 700 wash their clothes with electrical washing machines (or send them out for washing), that 344 have flush toilets and that 298 households have a refrigerator. But it does not yield information as to which of the 857 households having electricity, also wash their clothes with an electrical washing machine, also have flush toilets, also heat their house by means of a furnace, and so on. This information can only be gained by analysis on the scale illustrated in Table 2, on the next page.

Table 2

Scale Types - Distribution According to Items
And Households, 1,015 Respondents

| Scale Types Hi-Lo | Items | | | | | | | | Households | | | |
|----------------------|-------|---|---|---|---|---|---|---|------------|-------|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | N | N Cum | % | % Cum |
| 1### | + | - | + | - | - | + | + | + | 51 | 51 | 10 | 10 |
| 2 | - | - | + | - | + | - | + | - | 58 | 109 | 11 | 21 |
| 3 | - | - | + | - | + | + | + | + | 31 | 140 | 6 | 27 |
| 4 | - | - | - | - | + | + | + | + | 26 | 166 | 5 | 32 |
| 5 | - | - | - | - | - | - | + | + | 93 | 259 | 18 | 50 |
| 6 | - | - | - | - | - | + | + | - | 102 | 361 | 20 | 70 |
| 7 | - | - | - | - | - | - | - | + | 39 | 400 | 8 | 78 |
| 8 | - | - | - | - | - | - | - | + | 43 | 443 | 8 | 86 |
| 9 | - | - | - | - | - | - | - | - | 69 | 512 | 14 | 100 |

Note -

| Items | Reproducibility [#] | Scalability ^{##} |
|----------------------|------------------------------|---------------------------|
| 1,2,3,4,5,6,7, and 8 | .93 | .73 |
| 1,2,3,4,6,7, and 8 | .94 | .88 |
| 1,2,3,4,6, and 8 | .96 | .85 |

The coefficient of reproducibility is .93 with the eight items and .96 with only six items. A coefficient of reproducibility of ninety-three means that once we know the positive signs of a given respondent - say six out of eight - we can predict with ninety-three per cent accuracy which among the eight items are present in the household. We would incorrectly predict the presence of an item in a household seven out of one hundred times.

The higher the scalability of the scalogram the better its reliability and the higher the confidence we can place in its findings. Scalability is based on the number of responses which conformed to the scale model. And those responses which do not fall within the scalogram pattern, as predicted in the ideal dichotomization, are called scale errors. Assuming that there would not be any scale error, the scalability would be 1. In our case the scalability of .73 is increased to .85 when only six items are kept. There are two fundamental reasons for retaining the eight items. First of all, the larger the number of items, the less the likelihood of spurious Guttman scales. Secondly, the larger the number of items, the finer the calibration of the instrument.

For key to numbers see table 1.

There are altogether 503 non-scale type responses and the multiplicity of their various patterns (seventy-one) prevents us from any attempt to present them all here. Instead, we will give in a footnote¹³ the four patterns which are the most important ones and which represent thirty-five per cent of the total number of scale errors. All the other non-scale patterns have a rather small, insignificant incidence. The number of non-scale patterns was numerous, but the total number of scale errors was not large enough to make us reject the scale, which had an outstanding utility in our studies of poverty-affluence.

13. The four most important non-scale patterns:

| Patterns | Scale Items and Signs | | | | | | | | No. of Households |
|----------|-----------------------|---|---|---|---|---|---|---|-------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| A | + | - | - | - | - | + | - | + | 60 |
| B | - | - | - | - | + | - | + | - | 35 |
| C | - | - | - | - | + | - | + | + | 28 |
| D | - | - | - | - | + | - | - | - | 23 |

To illustrate briefly what these scale errors are we will discuss the meaning of the A pattern. These households did not qualify for a positive sign on the first five items, but they own a washing machine (the sixth item was then rated positively). They had an unfavorable rating on house type but have electricity in the house. If these sixty households had had a house in better condition of repair they would have qualified for a positive sign on that item. This means that these sixty households would have become scale types along with the 102 which already belong to scale type number 6. Another way of looking at it, is as follows: if they had not had a washing machine, they would have become scale type number 8 and been added to the 43 which belong to that scale type.

Conclusion

This article reported on how the research instrument was built. It mentioned briefly how the scale was used. To summarize: the purpose of building the scale was to differentiate communities of the county and rank order them along a continuum of poverty-affluence. This scale can also be used to rank individuals within a community or across communities whose economic cultural patterns are similar. Communities were scored on the basis of their individual members and were given average ratings. These ratings were used for rank ordering communities of the county.

It was very fortunate that a Guttman scale emerged out of our data. It was the best instrument we could hope for. A merit of the scale, among others, is the fact that it tells quite a lot about the value-orientation of individuals. The order in which the items are ranked (from high to low) reflects those material possessions which can be owned by the well-to-do families and which are part of the aspirations of those rising in the scale of prestige, especially in a society where material possessions are an important criteria for stratification.

This scale may prove to be of value, not only for the Stirling County Study but for the entire northeastern part of Canada and the United States. It has, in any case, considerable utility as a method for comparing the levels of living in various communities in Stirling. We hope that it will become a standard instrument in the public health administration field by quickly detecting underprivileged populations.

Selected Patterns of Sentiments
Bearing on Mental Health

by

Charles C. Hughes, Allister M. Macmillan,
Seymour Parker, Robert N. Rapoport.

Introduction

This paper describes sentiment patterns in a number of similar rural neighbourhood "pockets" which are scattered in various sections of Stirling County, none at any great distance from another.¹ These pocket neighbourhoods vary in size from eight to thirty families, containing in all about seventy. They are alike in having a history of economic depression going back some fifty years and are characterized by ethnic mixtures. We have named those pockets we have studied intensively: Lower Jonesville, The Bog, and Monkeytown.

1. The authors wish to express their thanks to Mary Rushit, M. Adelard Tremblay and Robert J. Weil for discussing concepts and numerous other aspects of the paper. In addition, appreciation is due to Urie Bronfenbrenner of the Departments of Psychology and Child Development and Family Relations, Cornell; Jean Downes, the Milbank Memorial Fund, New York; Oscar Diethelm of Cornell Medical College; and Robin M. Williams, Jr., of the Cornell Social Science Research Center, Alexander H. Leighton, Director of the Stirling County Study, - all members of the Stirling County Study Editorial Board.

Most of the literature about the social and psychological effects of economic depression has been based on short-term, relatively sudden conditions, lasting less than a generation. We present the material in this paper because it appears that such economic effects, in the region we studied, have transcended individual experience and have become stabilized in a body of interpersonal norms and expectancies, thus, the pockets appear to be sub-cultural groups with their own norms and sentiments. These distinguish them from the other areas of the county.

The people living in the surrounding areas tend to recognize the inhabitants of the pockets as "different", and this perception is expressed by discrimination and the maintenance of social distance in relation to them. It should be noted that we do not consider it at all probable that these pockets or the individual sentiments we find here are unique to this area. Rather, we present the description because we suspect that the same complex of economic conditions, sentiment patterns and attitudes may have very widespread occurrence in the larger society². It is the particular structure of this sentiment complex in these sub-cultural pockets which is of interest to us here.

2. Evidence for the possible universality of such attitudes in the wider society, while only scantily documented and impressionistic in character, is based on personal communication with other social scientists. One has noted very similar patterns of social phenomena in rural French Canada, English "Upper" Canada, Illinois and Virginia, while another has drawn our attention to strikingly similar behavior and attitudes between certain caste groups in the Middle East.

Method

Each author has spent a considerable period living in the field and carrying out a variety of social science investigations. Periods of time spent in actual contact with individual pocket areas have varied from one to five months. In three cases there was an overlap in the time two of the authors worked in the same pocket. The principal methods used to gather data on the scene have been partial-participant observation and the key informant technique. These were complemented and supplemented by a sociological survey based on a county-wide sample.

In some of the pockets each household furnished one or more key informants for "informal" interviews and nearly every household was represented in the sample which responded to the structured questionnaire. The surrounding communities have been studied in a similar fashion though the sampling rate was lower. The key informants from these surrounding communities represent all levels of the wider society such as clergymen, county and provincial politicians, merchants, physicians, teacher, the public health nurse, welfare workers, lumbermen, farmers, fishermen, day labourers and "summer visitors".

Historical background has been derived from two general sources. The older key informants in and outside the pockets have provided information about local history in a personalized and informal way. Sources of the more formal kind were the files of various county newspapers, records and histories, provincial

documents, and a variety of federal government papers³. The historical background sketched later in this paper is our tentative formulation from such informal and formal data. It is not, quite frankly, the result of the kind of careful historical survey which would be necessary for a more extended treatment of the implications of our findings.

Concept of Sentiment

This paper, then, throws light on certain facets of the culture of these economically depressed rural neighbourhoods. These we present as "cultural sentiments"⁴. We define "sentiments" here as "ideas or action tendencies charged with emotion and persistent like habits - partially cognitive, partially affective and partially conative"⁵. The sentiments formulated in this paper are

3. For example:

Submission to Royal Commission on Maritime Disabilities within Confederation, Nova Scotia, July, 1926.

Submission to Royal Commission on Dominion-Provincial Relationships, Nova Scotia, February, 1938.

The Economic Effects of the War on the Maritime Provinces of Canada, Institute of Public Affairs, Dalhousie University, Halifax, 1944.

The Maritime Provinces in Relation to the National Economy of Canada, Department of Trade and Commerce, and Dominion Bureau of Statistics, Ottawa, 1948.

4. In writing this paper, we have considered such concepts as Opler's notion of "Themes", and Kluckhohn's formulations of "Cultural Enthymeme", "Value", and "Value-orientation". But we retain a preference for the concept "sentiment" primarily because it emphasizes the affective aspect of these propositional statements, while allowing for the functioning of a cognitive element, that of orientation to the situation.

5. Leighton, A.H. Governing of Men, Princeton, 1945. For earlier views on sentiments: c.f. McDougall, W., Introduction to Social Psychology, any edition; and the "Manchester Symposium on Sentiments" by Rivers, Tansley, Shand, Pear, Hart, and Myers. Brit. J. Psychol. 1922, Vol. 13, Part II, pp. 107-148.

"cultural" in that they are shared by most members of the pocket groups. An explanation of how we have arrived at these sentiments follows.

We originally set out to examine the social and cultural life of these rural areas as part of our overall plan of research, which included developing indices of social disorganization in the county. We had spotted these particular rural pockets first because they were "poor" in material goods, and "degenerate" by local reputation. On closer investigation and with the usual comparison of notes between field workers, we became interested in the pockets themselves, because of their similarities in attitudes and "philosophies of life", and because they were unlike the surrounding communities in many ways. In our daily contacts with the pocket people we noticed many kinds of overt behavior ranging from aggression to apathy and we attempted to gain an understanding of the underlying motivations involved.

Much of what we suggest here was implicit in certain behaviors, but there was enough explicit expression, at varying levels, to verify, (at least approximately) the conviction that most of these people share a "peculiar" way of perceiving and reacting to the world about them. There is, of course, some variability in behavioral expression from individual to individual, but we feel that in general the sentiments given below represent commonly held ideas. We present them as quotations, as though they were expressed by a more literate pocket dweller, as "true for his kind".

Actually each sentiment is an abstraction from a universe of many discrete acts and attitudes which we have encountered. As a result, each of the sentiments presented below actually represents a complex of inter-dependent sentiments.

It is not our intention, at this stage of our knowledge of the pockets or the surrounding areas, to attempt to formulate any overall patterning of the sentiments in relation to each other in the sense in which Ruth Benedict used "patterns" in her "Patterns of Culture". Instead, we conceive of each of the given sentiments as a pattern and though inter-relationships are mentioned in a few instances, we feel that to embark upon a plan of integrating them into a single ethos would be presumptuous and speculative on our part.

Patterns of Cultural Sentiments

Sentiment 1: "We (the people of this community, a given depressed area) are morally and mentally inferior to other people, and there isn't much we can do about it".

The people of the neighbourhoods cannot participate fully in the occupational, educational and social activities of the communities about them. They cannot get or hold good jobs (as their "outside" neighbours can). They cannot achieve as high a level of education. They cannot take part in the same kinds of social and institutional activities. Outsiders, living in "respectable" communities, explain that the people of the depressed areas are mentally and morally inferior to ordinary people. More important, the pocket people themselves have partly incorporated this prevailing belief of inferiority, into their self-images.

Such a concept of self⁶ inhibits their motivation to improve conditions; and the apathy resulting from this inhibition strengthens the outsiders' tendencies to make negative evaluations of them. A vicious circle, which appears self-perpetuating, is thus created.

Overt manifestations of this sentiment are many and easy to find. They are expressed in two ways depending on the type of relationship between the participant observer and pocket dweller informant. When the informant views the observer as an outsider of superior status, he is likely to express the sentiment by continuous belittling comment about neighbours, friends and relatives. The informant's attempt to dissociate himself from his fellows is vituperative, but hardly convincing, for he often shows characteristics very similar to those he condemns.

Following are illustrations of this first type of expression taken from field notes of the authors.

Bennie Chiasson continually refers to his neighbours of Acadian origin in Lower Jonesville as "igorunt", "stupid" and "malicious". He blames this supposed anti-social and hostile behaviour on their ignorance and says one can't even take a dog hunting in the woods around that community, because the people are likely to shoot the dog out of malice.

6. cf. Eisenberg, P. and Lazarsfeld P. "The Psychological Effects of Unemployment", Psychol. Bull. 1948, Vol.35, pp. 258-390. "If he feels that the fault of his unemployment is not his, he will remain largely untouched. But if he loses all these footholds, then it is likely that his ego level will be shattered". (p.367). Also see: Angell, R. "The Family Encounters the Depression", N.Y. Scribner, 1936. p. 201. "He has completely lost his role. He is unable to face what he considers exposure. He considers himself a failure. His inadequacy stands revealed to himself".

Davie Jack Tangirrault tries to avoid identification with his neighbours while talking of his only brother Arnie Jack Tangirrault, who lives in the same community of Monkeytown. He criticizes (quite correctly) his living conditions as shamefully slovenly. He characterizes most of his neighbours as "no goods", "drunks" and "thieves".

One man, not wishing to be classed with his "ignorant" neighbours, eagerly offered to demonstrate his reading ability, although he could not pronounce many of the words.

Another, living in a miserable and cluttered shack in the Bog, father of several illegitimate children in the neighbourhood and generally considered "queer", continually berated his nearest neighbours for immorality and crookedness, and all his neighbours for irresponsibility and toughness.

Such informants may be expressing residual feelings that they cannot state very easily within the community because friendship and co-operative bonds are very tenuous. It may be that they are afraid of disrupting and shattering these by hostile expression in the group and have a suspicion that the others feel the same distaste and distrust of them.

More intimate contact with the informants indicates that they are secretly convinced that they share these undesirable characteristics they belittle in others. This admission (overt or covert) is the second way in which this sentiment is expressed. One example of it is the dissociation the inhabitants frequently attempt when they are away from home. Asked where they come from, they will often give a vague answer, naming only the region of the county or the nearest community of high status. Additional ways in which this conviction is expressed are indicated in the following field notes:

When the union organizer⁷ tried to interest the men in developing a labour union through which they could work to help their economic situation, they laughed at him because he was in rags, as they were. They feel that no one of their type could possibly deal successfully with the outside world.

Jimmy Casey of Lower Jonesville, drinking very heavily one day, burst out with a flood of expressions of frustrations and despair. He revealed basic feelings of ineffectualness and kept blaming his failure and depressed status on his own inferiority. "I'm no good anyway", he kept saying.

The story of how a typical member of the Lower Jonesville community tried to migrate illustrates these fears and feelings of inferiority. Harwood McElab moved to a town near Boston to get better work. He described his loneliness and feeling of inadequacy because people around him were superior, "higher up", and better than he. His entire life routine centered around going to work and coming home from work. His fears prevented interaction with others: he had no dates with girls, no social activities, little informal human contact. He returned to Stirling County although he knows his possibilities outside were better. He now speaks wistfully of these better opportunities, but never dares try to grasp them.

Sentiment 2: "Our condition and behaviour, and the social evils that they entail, are due in large part to physical inferiorities transmitted genetically, and so they can't be changed".

The concept that genetic inheritance is almost solely responsible for mental, social or moral inferiority is extremely widespread in the county. Employers, ministers, teachers and other responsible persons hold it, as well as the public at large.

7. This institution has been a very recent innovation in the county. It was organized almost single handedly by an acculturated French-Canadian immigrant who anglicized his name and gave up Roman Catholicism. He has had the greatest difficulty in getting the ordinary mill labourers to grasp that they stand a reasonable chance of raising their living standards considerably if they would really get behind him. Organizers of co-operatives meet a similar apathy.

A statement by one "outside" middle-class informant demonstrates the point:

At least in town with the English people, they have brains enough to know that what they are doing is not right, but in some of the depressed areas like Monkeytown and Lower Jonesville, it's their nature to do those things without their conscience bothering them any. My feeling is that it is a "throwback" to the things the ancestors of these people did in the country they came from. In a lot of places in Europe these things are considered natural and not immoral, as they are in England and Scotland.

The members of the pockets themselves have come to blame crime, immorality, violence or irresponsibility by any one in their group on "weaknesses" in the family lines. The La Flames are "silly and stupid"; the Quiltkults are "murderers, because of their Indian blood"; the Bradys are "drunkards", and the Tangirraults of Monkeytown are regarded as sub-normal mentally and irresponsible morally. The Caseys of Lower Jonesville are reputed to be naturally violent, and coloured blood in the Steens and Strongs is said to account for their inability to live "decent" lives. Rarely does the informant admit this sentiment for his own family, however; it is his neighbours who have "bad blood". Yet the way in which this sentiment permeates the community shows how each personality reflects the attitudes of the surrounding communities.

Sentiment 3: "Life is very lonely because we feel drawn toward social gatherings, but on the other hand, we feel afraid of rebuff in these situations, particularly with people from other communities around. So it is hard to enter into a group".

One facet of this sentiment, attraction, is sometimes expressed in extreme curiosity, such as peeping; listening; drifting over to newcomers in the neighbourhood or to groups that form on

corners to hear what is being said; breaking off conversations in houses to see who is passing by on the road; and sitting for hours in the doorway to watch the passers-by and discuss what they may be up to. People's curiosity frequently seems to be directed toward seeing what they are missing, rather than toward finding new activities and interests. It is primarily dependent, existing passively on others' activities. In conducting our interviews, we have often found it difficult to obtain privacy because a neighbour soon sidles over to join the conversation.

The other facet, repulsion, is revealed in behaviour showing timidity, apathy and negativism. A few pocket area respondents to the interview⁸ even ran into the woods; some were extremely cautious about opening doors, showed fear and distrust; and most were generally reluctant to talk to us. However, they slowly became friendly and more open.

A lack of neighbourhood visiting patterns, which are normally characteristic of many rural communities, is a striking feature in the pocket areas. Fear of quarrels, gossip or fights inhibits visiting, except with closest relatives, and even this may be rare among some family members, because of mutual antagonism. One finds extreme cases of isolation: extensive sleeping and loafing at home with little human contact at all.

Lack of cooperativeness at work is also a manifestation of this sentiment. Workmen at times refuse to help others because

8. Sociological questionnaire sampling in 1952 (Family Life Survey)

they fear getting into trouble. If they give advice or help they may meet blame or some other difficulty. The safest course is a minimum of involvement.

Most frequently, however, the two extremes of this sentiment are fused into vacillating behaviour⁹. Some illustrations of this are as follows:

Men from the pockets may come from long distances to attend union meetings. But once inside the meeting hall, they frequently engage in small conversations in the rear of the room, which disrupt the meeting; or they sit passively, failing to participate in the functioning of the organization.

These same tendencies appear at church social gatherings:

People from the depressed areas come from miles around but cannot be induced to enter freely into the social activities. They hang around the outside, like moths drawn to a flame but afraid to come too close lest they be burned. Many need to be quite drunk before making even a peripheral appearance.

Similarly at a school Christmas party, the principal constructive activity, both by performers and by a supportive audience, was contributed by school district

9. Rundquist, E.A. and Sletto, R. F. Personality in the Depression: A Study in the Measurement of Attitudes. Univ. of Minnesota Press, 1936, p. 363.

"Probably the unemployed tends to withdraw from society because of loss of status and feelings of shame. He may withdraw into himself and even from his family. In that sense, he would become more introvertive and less sociable".

And Shaffer, L.F. The Psychology of Adjustment. New York: Houghton Mifflin, 1936, p. 137.

"In the early or 'varied responses' stage of adjustment to thwarting it is typical for the reaction of timidity to alternate with the more aggressive types of defense. For an individual to be shy and seclusive at one moment, and to be bold and overhearing the next, often seems inconsistent but it has psychological coherence since both forms of response indicate attitudes of inferiority and fear of social criticism."

residents not from the depressed area. The pocket people stayed outside in cars and trucks, drinking and necking; sat passively in the rear of the hall; or indulged in disruptive cat-calls, jokes and noisy behaviour. They showed interest in the activity beforehand and they talked about it a good deal, but when the time to participate arrived, their attitudes were on the side of distrust and repulsion.

Even lifelong associations among the pocket people are, in general, characterized by ambivalence. Two people may drink and visit together intimately for years, enjoying what appears to be a friendly relationship, and yet with comparatively little provocation, one will talk freely to an outsider about the other's faults and unpleasant qualities. Informants frequently indicate that their friends are trying to undermine their reputations. These lonely people apparently need very much the activities of friendship but human trust is so tenuous as to be almost lacking. Lower Jonesville seems to lack even this pseudo-friendship pattern. Intra-community hostility there apparently has mounted so high that interpersonal repulsion outside the family prevents formation of even the most rudimentary bonds.

Sexual promiscuity expresses this ambivalence, too. Unstable male-female relationships reflect attraction and gratification combined with mutual suspicion, infidelity and distrust. The concept of fidelity which in the larger society is usually associated with love, is not well developed among the pocket people. Rather promiscuity offers gratifications, prestige through new conquests, and a sense of power and control. These human relationships, established in this manner, do not usually

develop stability and only precede new cycles of attraction and repulsion.

Sentiment 4: "People with power and authority are to be feared and distrusted, because they are likely to be exploitative: but they must be treated with deference".

Bitter lessons have taught these people that they must fear and distrust individuals in authority positions¹⁰. Employers use the people of the depressed areas for the intermittent jobs, laying them off in a manner that appears to them whimsical; religious leaders stress the threat of divine moral sanctions, as is frequently done in a community where life patterns conflict so with the norms of the larger society; and political leaders are felt to be interested only in votes. One often hears it said that the politicians are very friendly at election time, but don't even recognize an individual on the street afterwards. The "government" is perceived as the source of restrictive laws on hunting, taxation, land ownership, timber cutting and fishing; and it punishes through its instrument of force, (the police "agin the common man").

On the other hand, the people of the depressed areas must show deference to those in power, because they depend on the latter for their very survival. Without land on which to survive as

10. Among the indicators of the widespread or possible universal nature of this sentiment, see Spinley, B.M. The Deprived and the Privileged, London: Routledge and Kegan, Paul Ltd. 1953, p. 130. "He (the London slum dweller) has marked aggressiveness which is permitted violent expression and his attitude toward authority is one of hostility and rebellion". In addition, the author gives illustrations of city slum sentiments which are closely akin to those we indicate for this rural area - cf. Sentiments 7, 9, 10 and 13.

independent farmers, (even if they know the agricultural techniques of their forefathers); without sufficient skills for successful competition on the job market; without enough education to deal with complex problems of modern existence (even for such activities as banking and mail-order purchasing); they must depend heavily on the authorities. Political bosses provide patronage and such jobs as road work; economic bosses provide work and credit; religious leaders control access to the only supposedly unqualified "accepting" social group and to supernatural protection and blessings; and the government provides pensions, family allowances, welfare and other benefits that form a goodly portion of their income.

Expressions of this sentiment begin in the family during infancy. The father is the authority figure and the child learns early that he is unpredictable and is likely to punish quickly "without reason" and just as quickly to become relatively benign and aloof. The resulting uncertainty about the father's intent appears to be generalized later on to all authorities and the distrust it engenders is often reinforced by adult life experiences. Any new situation involving figures perceived to be authority types thus probably calls forth fear and apprehension.

In the work situation, hostility toward the bosses in a lumber mill causes a generalized distrust of anyone who takes on role characteristics associated with bosses. For example, when a new labour relations man at the mill proposed reforms unquestionably benefiting the men, he faced a great deal of resistance because the workers identified him with the "boss". The men so deeply distrusted his motives that they immediately suspected anything he proposed as having hidden exploitative intention.

Deference in front of persons who have authority does not imply the same attitude in their absence. On the contrary, they are very commonly targets for hostility. A clergyman in one of the areas, for instance, is treated deferentially, but behind his back, he is accused of drinking, gambling and promiscuous sexual relations.

Sentiment 5: "Successfully defying authority in minor ways can enhance one's position with the local group and also restore one's own self-respect, if you can get away with it".

Because the relationship of dependence on authority entails a need for overt deference behaviour such authority must usually be defied covertly, if it is to be defied at all. However, local prestige and a sense of power and achievement can be gained through a successful act of defiance in the very face of authority.

An illustration of covert defiance exists in the success of Arnie Jack Tangirrault of Monkeytown in carefully carving an ornate toothpick from the os penis of a bear and presenting it to the sister of a wealthy leader. The idea of this dignified lady picking her teeth with such an instrument provided the pocket people with much mirth for a long time and gave Arnie prestige.

Semi-covert mockery of religious authority is seen in the case of a farmer in the Bog area who named his oxen "Jesus" and "Christ", much to the enjoyment of the secular folk about and to the despair of the devout.

Many illustrations show how open defiance of authority gives prestige. Monkeytown's hero in acts of this sort is Arnie, and Bog's is Frankie Mack Chiasson. The following is an example.

Frankie claims to have experienced a miraculous cure at a well known Catholic shrine and to have subsequently regarded his own person as divine and inviolate. He has often openly defied priests and organized religion. Once he challenged God loudly and eloquently before an audience of his shack store patrons by shaking his fist at the heavens during a thunder storm and stating that if God were truly stronger, He would strike the place with lightning. When the lightning failed to come, Frankie proudly proclaimed that he had met God in a test and proved himself stronger. His defiance of religion once reached such a pitch that he actually spat in a priest's face. But later, another priest from a nearby college visited the store to sell tickets to a church picnic and successfully met Frankie's defiant gestures. The priest was greeted arrogantly by Frankie, who, before an audience of customers and loungers, shouted that he was not afraid of the priest or of the church or anything they could do to him, because he was indestructible. The priest calmly asked Frankie if he had a gun in the place. He then asked him to get it so he could demonstrate to the group that Frankie was not indestructible. Frankie was forced to back down.

A situation in a lumber mill also illustrates this defiance of authority. The owner, at a union meeting, stated that before he would see a certain measure adopted he would leave the mill himself. One member of the union stood up and told the owner he could start walking immediately. This story of the member's courage and defiance was passed around for some time and he was later elected an officer of the union.

Sentiment 6: "The world around us is full of threats from supernatural sources like witches and ghosts that are dangerous and punishing, and you always have to be on your guard".

While members of these areas work and hunt in the forest much as others in the county do, many seem to have a higher level of fear, particularly at night, of harmful or evil forces that may lurk there. While possibly this tendency is born by projecting anti-social impulses into people and the world around, it is nurtured by the myths and folk stories of older generations and by the ghastly

and bloody comic books and pulp magazines of the present.

Stories are common about the returned ghosts of murdered people running around the woods and about ghosts giving signs, particularly as retribution for evil acts or wishes. There are stories about omens of evils and dangers to come. An illustration:

I remember once, and this I'll always believe no matter what, because I saw it, my brother, Joe, was working back in the woods at Round Lake for A.B. There was a little piece of woods along the road where he was coming out to return to our home, and one night while I was sitting there with my wife, we looked out of the window and there was Joe coming. We both saw him coming out of the woods. We waited and waited and he didn't come in, so I went out and looked around for him. There was snow on the ground, but there was no tracks back there. I went out in the woods in the direction that he was coming from and found him way back in the woods on the other side of my house. He was sitting on a stump and holding his head. He had been hit by a flying chip of wood and within a month he died of a brain abscess.

Several cases of alleged witchcraft have occurred in the Bog area. One woman puts the "wish" on people, to bring them to bad ends. Witchcraft has also been attempted by the very rudimentary means of drawing pictures showing the intended victim falling or being injured. "Witching persons" often make threats of harm and punishment by mysterious methods, unless certain of their demands are granted.

Even in regard to organized religion, these people seem to emphasize the punishments rather than the rewards of the church's supernatural system. God might strike one blind or cripple another. The Devil is an ever-present source of trouble and pain. While the religions of the areas provide, as a rule, a weak force for moral

improvement, to the extent that they have any effect it is through their threats of supernatural punishment rather than through their teachings of goodness and love.

Sentiment 7: "Human success - getting ahead in life - is beyond the control of the individual. The main forces behind social and material success are luck and pull".

The concept of succeeding through one's own efforts is not well developed here, nor is it strongly felt that God helps a good man. There seems to be, instead, a widespread feeling that the only forces that raise one man's living standard over another's are luck and "pull"¹¹, with the right person¹².

The popularity of gambling is a specific expression of this sentiment. People who cannot feed their families adequately will risk scarce funds in frequent card games at such "hang-outs" as Frankie's in the Bog. One man had saved several hundred dollars over a lifetime, but he risked the entire amount in a get-rich-quick scheme that depended on luck. He relied on the operator's promises instead of planning a program of work and development of his own resources.

Apathy toward programs of improvement and initiative result, at least in part, from this sentiment. The general attitude is that there is little use in looking for work or even thinking of future possibilities since success or failure is

11. Again, as we noted in the Introduction about the possible widespread character of those sentiments, see Bakke, E.W. The Unemployed Man, N.Y. Dutton, 1934, p. 14., for a similar phenomenon in another economically depressed area.

12. From their responses to a questionnaire, there was little indication that they believed hard work or any effort on one's own behalf was effective.

governed only by luck, which operates without effort on your part, or "pull", which you know you do not have.

Sentiment 8: "Concerted activity toward long-range goals is senseless, because it is likely to be futile. Short-range gratifications are the only things worth striving for".

This sentiment is implied in those already stated and its expressions are numerous. In general there is very little anticipation of, planning for, or aspiring toward future events¹³. Even the few misers hoard apparently for the immediate gratification of saving rather than for future activities or for old-age security.

Old-age and veterans disability pensioners sometimes drink up a large part of their pension check on the day they receive it. Liquor is a favourite means of immediate gratification. A union member said that if he paid the union dues, he didn't know where the money would go or what would become of it, but when he had a bottle in his hand, he knew what the money had gone for and that it was sure to bring him pleasure.

The work practices of the pocket people offer many other expressions of this sentiment. The men from these areas are considered irresponsible; they often do not appear for work at an appointed place, though they have agreed to be there; they work long enough to pay for food, back bills, or a bottle of liquor, then

13. This low economic and rejected status complex also appears prevalent among London slum dwellers. See Spinley, B.M. op.cit. p.84 "To postpone pleasure for a time it is necessary to be certain that ultimate reward will come and will be worth waiting for. The slum dweller has no such certainty. He cannot be sure of greater love, longer education, greater economic reward, for he sees that these rewards do not come to his associates and he is basically insecure. Therefore, he takes what he can while he is sure of having it, e.g. a night of fun at the club, a dead-end job, an early marriage".

quit until need presses them into working again. "let someone else work for a while at it; I've got my share". "I've got enough for now; I'll give someone else a chance". This behaviour results from their evaluations constantly made in terms of immediate needs rather than long-range goals.

Sexual promiscuity, in addition to manifesting the attraction-repulsion characteristic of Sentiment 3. above, could also be regarded as an expression of this sentiment. The moment's pleasure seems the only sure thing.

Other patterns of spending, in addition to the purchase of liquor, express this sentiment. Girls working in clam plants buy impractical clothing such as silk stockings and fancy dresses, which they soon ruin at work or at home, but which provide momentary gratifications. Health and sicknesses are neglected and most family meals would shock a dietitian. For example, some people live for days on boiled cabbage or on pancakes with molasses and baked beans. Very little effort or planning is expended, even on vegetable gardens, poultry or dairy farming.

Sentiment 9: "Things, people and events are to be evaluated in a utilitarian manner. Thus, in human relationships, behavioural patterns are governed less according to traditional role values than according to expedient utilitarian ends".

The degree to which the pocket people hold to an expedient, utilitarian basis for human relationships is impressive. Behaviour between people whose ideal role relationships are warm and non-utilitarian, such as family relationships, is here largely lacking in these qualities. A striking example is Bill, a bachelor and

father of several illegitimate children. A miser, he has accumulated some money (reputedly well over \$5,000) which he lends for interest. But he refused loans to two of his natural sons because they lacked the usual collateral he required. One needed money for hospital expenses; the other wanted to buy a boat and begin to fish for a living. Neither could arouse a sense of responsibility, much less any of the traditional fatherly feelings, in old Bill.

Other fathers exploit their children by putting them to work, taking their pay checks, or as effectively, by failing to provide for the family, forcing their young to go to work. One also frequently finds in these neighbourhoods that the husband-wife relationship has a mutually exploitative utilitarian basis. Concepts of love, sharing and planning play a minor part.

The utilitarian outlook is associated with a general tendency toward secularization. The attitude is frequently voiced that since the church cannot do anything concrete for one, it is useless.

The considerable intra-group lying, cheating and stealing, within the neighbourhood and among relatives, are also in part expressions of this sentiment. A well-to-do Robertsville resident, Boisvert, became a friend and benefactor to an ill neighbour. Rumour then began to spread in the nearby Bog pocket that Boisvert helped the invalided neighbour only in order to win the latter's wife.

Sentiment 10: "Physical labour is a necessity for satisfying immediate needs, but has no intrinsic value".

Many attitudes toward work and the job situation already mentioned exemplify this sentiment, which contrasts with attitudes in the surrounding communities. Typical is a man's failure to appear at work because the need for money has not yet pressed him hard enough, or his quitting as soon as he has cash for immediate goals. In former years, the entire region was characterized by strong feelings that work is a good thing in itself and that building for the future well-being of the family is worthwhile and necessary. To a certain extent these values prevail in the outside communities today, but both attitudes are lacking in the pockets. In their place is the pervasive feeling that work is largely exploitative, that it is an unpleasant and difficult activity, but that one must endure it periodically to keep alive.

Expressions of this sentiment overlap attitudes toward employers, concepts about advancement, etc., that have already been given. In a lumber mill, for example, when a worker cuts a driving belt so that he can loaf during repairs, he also enjoys a successful gesture of hostility toward the mill authorities. Slow-downs and apathetic responses on the job similarly are partly related to this sentiment. A common complaint the old-timers make about young people in these areas is that they are incapable of sustained hard work. They stop as soon as the foreman or boss turns his back. Ditch diggers are said to dig rapidly until they are hidden from sight, then lie in the trench smoking until the foreman appears.

Commenting on their job attitudes¹⁴, workers from these areas gave a prevailing opinion that their only interest was in "putting in time" and getting the wage. Illustrations:

"Don't make any difference to me as long as I got my time in". "Don't make no difference (whether they move me around a lot or not) as long as I get a day's pay.....One job is the same as another.....I work for a day's pay, so what do I care about what kind of job they put me on, so long as they pay me for it?.....No job is good down there".

Sentiment 11: "The most highly valued activities are those allowing escape fantasies and expression of hostility".

It seems impressive that in each depressed area escape and hostility patterns are extremely common, particularly in recreational activities.

Horror and fantastic comic books are highly popular among those who can read. The favourite radio programs are those of suspense, horror and violence. Movies are highly popular, and the operators in Bristol Town and Portsmouth derive most of their profit (despite objections from the "better" people of the towns) from violent and fantastic films. Many pocket people spend a disproportionate amount of their meagre income on these movies by going every time the show changes.

Excessive drinking is a common escape. Any intoxicant available (home made brew, bootleg liquor and deviant concoctions such as vanilla, rubbing alcohol, "sterno" and anti-freeze) is used. One lumber mill attempts to combat drinking among its men by paying them late on Saturday, after the liquor commission store closes.

14. In a questionnaire survey.

This policy, however, only drives the men to purchase very high priced bootlegged liquor. Drinking is sometimes accompanied by fighting (expressing hostility).

Sentiment 12: "Prestige and self-respect can be gained through the display of special knowledge".

The general feeling of being deprived or excluded from sources of information seems so strong that the people attempt to get special knowledge that will gain them respect or entrance into a group. Their curiosity has already been mentioned. Coupled with this is a noticeable desire to communicate information in order to show one's success and superiority in having gained access to it. Gossip, particularly hostile gossip, is highly developed. While hostile gossip to casual acquaintances is by no means universal in these areas, there are people who will even discuss with casual strangers intimate and damaging details of their friends' and neighbours' lives. Although this enhances one aspect of field investigation, it has damaging effects too; for the purpose is less to communicate valuable information than to gain prestige and confidence through imparting any "information" whatever.

The rules for communication implicit in this sentiment could be stated as follows: "If you know anything that might be interesting, tell it to anyone who'll listen. If you don't, make up something impressive".

In Monkeytown, one hears Arnie Jack Tangirrault's fantastic stories about the ancient life-ways of people whose traces he has seen in the deep backwoods, and about his prowess as a hunter. He gains standing in the area by repeating this special knowledge, which he

probably has come to think of as true. But often his imagination is the chief basis for the reconstructions. He has a great imagination and mixes fantasy with fact, making his stories credible by fastening them to very specific dates and places: "On the thirteenth day of December in 1924, at about 10:30 a.m. I was walking by Crum's corner just coming round by the southeast tip of the old orchard when....." Thus he gains prestige by showing off his "great memory", obviously admired by his audience.

Tom Miles, in a depressed section of Bristol, introduces himself as "king of the clambers", boasting of special knowledge and prowess in that field. Since institutionalized ways of awarding status are lacking (e.g. offices of the fraternal organizations), these people express their dreams of glory in fantasied special knowledge and achievement.

Another technique is to make it known overtly that something of a secret nature is going on that is not accessible to the whole group. Little clusters of men, formed around store corners, make it obvious that something is happening there; but the group "buzzes off" anyone who approaches, dodges him, or changes the subject, in order to keep the sense of exclusiveness and privilege. Whoever somehow gains a bit of genuine special knowledge, (e.g. finding a fine place for clamming) spreads the fact that he has such knowledge, but seldom shares the actual information. He withholds it as much for the prestige value of having it, as for the actual yield that the special knowledge may bring.

Sentiment 13: "Upward mobility. 'putting on airs' by any member of our own group makes him a suitable target for hostility".

Any indications of success at upward mobility can be interpreted as a threat to the notions embodied in some of the previous sentiments: e.g. that success is not due to individual effort or

worth, but to luck or pull; that we are inferior to our neighbours and thus there is no point to exerting ourselves for status improvement. These sentiments appear to avoid for the holder the continued pain of failure to succeed. Achievement of better status also tends to ally the mobile person with authority. As long as the pocket people feel that uncontrollable forces keep them down, they can avoid pain; but when one person successfully challenges this idea, the others must either attack him or undergo further self-disparagement.

The people express this sentiment frequently, especially whenever they note indications toward upward mobility by other members of their community.

Alice Brady Mason, attempting to change her life standards and improve the lot of her family and relatives, was half-contemptuously called "Queen Alice". The Bog community accused her of "putting on airs", recalling her early years with dark hints that she used immorality to win the support of the upper-class men for her efforts at upward mobility.

Scornful reference is frequently made in Monkeytown to a former member of the community who "married out" and established residence on Bristol's dignified Royal Road.

In all pocket areas, disparagement, ridicule, hostility and prediction of dire outcome are expressed for all who attempt self-improvement. When old Davie Jack Tangirvaul, for example, half-blind and aged, began to clean up his small field and tidy his property, he was ridiculed as a "foolish old man". When one individual took out a loan to build a better home, his neighbours in Lower Jonesville said that the lender was foolish to help him; "He'll never get his money back". In this prediction of failure were mixed

a deprecation of the borrower's ability to improve himself and an imputation of dishonesty.

Sentiment 14: "There are few differences between men and women aside from the physical sexual characteristics."

There are abundant indications that the behavioural differences expected between men and women in the surrounding communities (both Acadian-French and English) are somewhat diminished here, the female behaviour resembling more the behaviour traditionally associated with the male. Illustrations indicate how this sentiment is expressed:

Women's presence in a gathering, e.g. at the neighbourhood store, brings little change of language. Swearing and abusive talk continue almost as if only men were present and in some cases women equal men's virtuosity in such language, but usually not in public.

Women in these areas frequently work outside the home as domestics, at clam packing and at other jobs, to support the family or to augment its income. Parenthetically, we have noted that the prevalence of this sentiment expressed in the accepted work-role for women results in a decided weakening of the traditional mother-role, so that it is fairly common to find that pocket mothers pass along much of the responsibility for child rearing to an older daughter, a relative or others, even when a child is seriously ill.

Fighting and violence is another expression. Women sometimes get into fights at neighbourhood hang-outs and some are considered particularly rough characters, feared by men. One woman in the Bog area is said to "give her husband a licking once a week".

Sentiment 15: "New experience is frightening and innovators' motives are not to be trusted".

A history of changes that resulted in painful experiences for these people appears to have built up fear and distrust of new

experience and innovation. When innovation has come through power and authority figures, as is usual, the general nature of the relationships have been mainly seen by the pocket folk as exploitative of them. When members of these communities themselves initiate changes, it is often the failures that are stressed. Among the emigrants, for example, it is mostly those too ill-equipped to adjust to the outside who come back home and report their experiences.

An expression of this sentiment occurred when attempts were made to organize a labour union at a lumber mill¹⁵. Most of the men recognized a need for organization, but as soon as the union was formed, discontent, suspicion and apathy posed obstacles to its growth. The organizer was regarded as an exploiter during his efforts to form the association, although there were no grounds for this, since the position he occupied meant little material gain for him. The first questions among the men when he began were, "What's in it for him?" and, "What's he trying to get out of this?" He was then accused of trying to obtain a lucrative salary from the dues, of "selling out to the boss" and of trying to organize some kind of communist group. When he was forced to raise the union dues, this "proved" he was trying to get more for himself by squeezing the men. When he raised money to save his house from mortgage foreclosure, this again "proved" that he had "sold out to the boss". His efforts to show that these impressions were false met with little success.

15. See Note 7, on page 120.

Similarly, whenever one of the clergy attempts new programs or organizations, he faces suspicion and jealousy among those very people for whom his constructive efforts are being made.

A school teacher, when he tried to initiate adult education classes in the Bog, met major resistance, yet these were the people who would be most likely to benefit. Those in the surrounding well-to-do areas were more active and responsive, although they needed the help less. The difficulty encountered in organizing consumer co-operatives has been mentioned earlier, in another context.

An indication of how this resistance to innovation takes on an aspect of ritualism is seen in a lumber mill, where the management frequently complains that the men resist even simple minor alterations in procedure. These changes would involve no disruption in social relationships, no changes in pay, nor much effort for re-learning. A question¹⁶ aimed at getting the workers' attitudes towards job shifts brought answers like:

I don't like it because I have a feeling that I never know what I'm going to do..... When a guy gets used to doing something, he doesn't like to change.

Background

The pattern of sentiments now characteristic of these neighbourhoods appears to have evolved mainly within the past half century. What is the social and historical setting for these phenomena?

16. In a questionnaire survey undertaken among the lower economic level workers.

Throughout the Maritime region in the late eighteenth and early nineteenth centuries, the sheer necessities of a pioneering existence encouraged the continuance of the "folk" type of society then held by both the Acadians and the English Loyalist settlers. Co-operation and mutual assistance were highly valued in this close-knit, familistic society, with agriculture and fishing as the principal feature of their subsistence economy.

As homesteads became established and survival easier, men turned toward the heavily wooded interior for profit in lumbering and shipping, industries which were developing in the mid-nineteenth century. The tremendous economic expansion of this period has been termed, in retrospect, the Golden Age of the Maritimes. Wealth and prosperity rapidly increased, particularly among the entrepreneurial English families settled on the Stirling coastline, and the sailing vessels of the region spanned the world almost out-numbering, for a time, those of Britain and the United States.

At the same time, the economic potential of the area prompted a redistribution of labour. With a progressive shift from a self-sufficient agricultural economy toward a wage-labour system, many men lost their agricultural skills and orientations. (Even today the shift is not complete). The ship-building and lumber-exporting communities drew men from the backwoods farms to the coastal areas, to work as labourers and sailing hands. These wage earners (mainly of Acadian and mixed descent) tended to settle on house-plots

clustered on the outskirts of busy centers in which the leaders were mostly English-speaking. Work was plentiful, although not highly paid. A man was "no good" if he could not provide for his family, especially since he could find extra food with his gun and a winter's supply of wood in the nearby forest. In such a complex of economic practice and values, individual initiative was highly valued. The philosophy of "independence", as elsewhere in North America, flourished in these favourable circumstances, was transmitted to succeeding generations as a creed of life and was diffused throughout all strata of society. Non-intervention by government was a strongly felt precept.

This period of economic expansion was followed by a gradual decline during the latter part of the nineteenth and early twentieth centuries. One important reason was that the region's main trade item, virgin timber, was almost exhausted by 1910. But the pattern of economic individualism remained as a cultural heritage, together with a strong belief that "times will get better if we just hang on long enough". Most of the people were unaware of the great changes from a commercial to an industrial economy that were occurring in much of the world. The beginning of World War I saved the whole region from feeling the full effects of a depression that was otherwise well under way. After the war the economic plight became fully evident and we can see today, in the efforts of the Stirling County population to adapt to the new situation, the pervasiveness of these widespread and profound changes. In place of the thriving communities of the past, one finds general

economic uncertainty and difficulty, and in a few cases, areas of extreme poverty, social enomie and despair.

The region has also suffered waves of emigration and this has probably added to the social disorganization of the county and its economically depressed pockets, although we are unable to specify this relationship. In addition to economic factors, Acadian and English inter-marriages in the pockets have "watered down" the cultural traditions of both groups and helped to disrupt ties with the two major and ethnically distinct societies originally in contact with the pocket communities. Thus the pocket people have been left with minimal resources for communication, for coherent and stable associations, for constructive leisure activities, education and industrial skills; also, they lacked even a relatively integrated sub-culture acceptable to the wider society. They are poorly equipped, therefore, to cope with the disruptive changes in their lives. They also face effective psychological barriers to inter-marxying, buying land, or participating in other ways as equals of the "respectable" members of the larger community. A self-perpetuating set of attitudes and interaction patterns seems to have resulted¹⁷.

Concluding Discussion

What is the heuristic significance of the sentiments

17. Allister Macmillan and Alexander H. Leighton provide a more detailed description of some aspects of this process in "People of the Hinterland", and in Human Problems in Technological Change, Spicer (Ed.) N.Y.: Russell Sage Foundation, 1952, pp. 224-243.

presented here? We have indicated at the beginning of the paper that these pockets of Stirling County are probably not isolated phenomena and that they may be particular examples of a type of human existence that is widespread not only in rural but also in urban areas. It will take more research to discover the prevalence of such sentiments in our society, or to investigate such theoretical problems as probable causation, relationships between these kinds of sentiments, and the relationships of sentiments with various processes of social change.

Theoretical interest can be centered broadly on two fronts: (1) a consideration of the role of genetic factors in the genesis of these sentiment patterns, and (2) an investigation of the connections of historical events with the development of such problem areas. In other words, both hereditary and environmental factors require attention.

As to genetic factors, we do not have the data to provide a specific answer in the Stirling area. We have shown how the "outside" communities, as well as the pocket people themselves believe a major share of the phenomena to be attributable to biological inheritance. What data we have, point to the likelihood that there is some constitutional and genetic defect present, but this is only one element and does not by any means apply to all the people who show defective behaviour.

As far as biological factors are concerned, our own

studies in the pocket areas and the wider community¹⁸ indicated that the pocket children do not differ markedly from those in the surrounding areas, certainly not to the degree of verifying the favourite sobriquet, "feeble-minded", since our intelligence tests indicated many are of average ability. Whatever the proportion of retardation in the pockets, it appeared certain that for many of the children, the quality of their test behaviour was a function of having been raised in this environment. Whether we regard the genetic factor as major or minor, it is evident that the pocket people are operating some distance below their potential capacity and would profit from special training programs of the type which have demonstrated that the intellectual and social functioning of retarded children can be improved. Thus, we conclude that biological limitations per se are not a barrier to the solution of the problem.

Pertinent factors in the social environment are as obscure and as difficult to extricate. One obstacle seems to be in a combination of social forces which tends to precipitate constitutionally defective persons into these pocket areas where they breed together. Because of the sentiment patterns of the larger society the children in this milieu have very little chance of entering and experiencing a more adequate and satisfactory environment. The result is a self-perpetuation of these "deviant" sub-

18. Macmillan, A.M. Burma Road Report, Stirling County Study, 1950. MSS.

societies, at least for a generation or two. This is recognized by concerned laymen in the county, and is a major problem of social control.

We do not have sufficient time perspective or sufficient knowledge as to the etiology of these social forces to predict the future forms of these apparently self-perpetuating sets of attitudes, both within the pockets and in the larger community. Whether the process will lead eventually to some self-correcting social phenomena or to increasing differentiation from the wider society, we are unable to say.

Hence, though the findings we present are provocative, they fall short of adding greatly to our understanding of the etiology of the social processes involved. To know whether these phenomena have important connections with historical events related to technological and industrial change, as we have implied, we need further research. It should be clear that this aspect of the etiology is relevant, not merely in understanding such existing pockets, wherever they may be found, but in anticipating and avoiding what may be the consequent by-products of the ever-increasing rate of technological and industrial change, which characterizes the modern world.

What are the consequences of our findings for social health? Whether or not these pockets represent a phenomenon that is widespread, they constitute a type of social pathology: a way of life that not only lacks a reasonable level of happiness, but which at

present shows few signs of moving toward a better state of existence. The self-perpetuating process, augmented by the sentiments within the pockets and the attitudes of the larger community, offers small opportunity for the cycle to be broken successfully by even the more advanced individuals within the pockets.

Unquestionably the bulk of these people do not really "choose" this way of life, as is evidenced by sporadic attempts at emigration; but with the meagre resources they possess, they simply do not know how to get away successfully. McNab's experience related on page 120 is typical even for many who attempt local migration. It illustrates the difficulties these folk have in migrating into an unfamiliar environment. Actually returning to an extremely difficult situation "among one's own kind" is, for many, more bearable than the isolation, the technical incompetence and social inferiority they feel in a new environment. It would seem to be self-evident to anyone who subscribes to the main values of our larger society, that the children born into this milieu have a right to a better chance in life, something that will come a little closer to equipping them, in terms of values and in terms of formal education, to deal more successfully with the larger society.

The implications of these matters for the welfare and political stability of the county, province and the country are fairly clear. We have illustrated the difficulties these men have in holding jobs due to their sentiments involving the work situation. It is obvious that people with such sentiments do not make a good

base for industrial development programs. Further, the current state of today's larger society under strains and tensions at all levels and in all types, rural as well as urban, implies weaknesses in cohesion and stability, particularly due to economic and political factors. How much less able is that society to weather these vicissitudes if it contains within its structure numerous social groupings like the pockets where aggression, apathy, immaturity and other forms of non-rational behaviour are nurtured?

Without admittedly having evidence of any conclusive nature to offer at present, we suspect that many of the destructive demagogues of the past have had success due to the existence of people with sentiment patterns similar to those exhibited by the pockets whose "magic-thinking", for instance, leaves them particularly open to acceptance of fantastic doctrines, be they political, religious, or both.

In regard to the significance of these matters to mental health, we are not yet in a position to say definitely whether or not this complex of economic and ethnic factors and sentiment patterns in the pockets produces a high rate of psychopathology as understood in terms of syndromes treated in a psychiatric clinic. However, it seems clear that the major components of personality for the depressed area peoples are: self-hate and strong feelings of inferiority; distrust of one's potentialities and possibilities; an inability to conceive of distant and intangible situations which might motivate present action; a distrust of other people (who

cannot be relied upon for consistent need gratification); a sense of loneliness; an inability to encompass a symbolic field which includes both a final goal and a series of means and intermediate goals leading toward it; and an inability to make steady and consistent but slow efforts toward any goals.

If most of the theories prove correct about what constitutes healthy and unhealthy conditions of mental health, then the pocket areas are indeed seed-beds in which psychological disorder can readily flourish. In view of the apparent, widespread increase in the numbers of mental health problems currently in our society, it would seem to be important for us to ameliorate, if not remove, these kinds of social conditions which appear to foster, if not create, poor mental health.

The Distribution of Psychiatric Symptoms
in a Small Town

by

Dorothea C. Leighton, M.D.¹

Introduction

This paper is a preliminary report on some of the findings of an epidemiological study carried out in one of the Atlantic provinces of Canada. The area discussed is a town which we shall call Bristol (population about 3,000) and its immediate environs. Our focus of interest is the occurrence of symptoms usually indicative of some degree of mental illness. The study as a whole started in 1950, while the field work for the Bristol

1. While the author named above wrote the article, it is the fruit of the labors of many. Particular mention should be made of the other psychiatrists who took a principal part in the study at various times: Eric J. Cleveland, Oscar Diethelm, Price A. Kirkpatrick, Alexander H. Leighton, William D. Longaker, Thomas A. Rennie, Guy LaRochelle and James S. Tyhurst; of the statisticians, Garnet E. McCreary and Richard Schwartz; and of the interviewers, Jane Hughes, Beatrice Landman, Gordon Mason, Hilda Parker, George Roper and Janice Ross. Even this list leaves out many who contributed in a large measure to the plan or the details of the investigation.

ecological area began in June 1952 and was completed in January 1954.

In any assessment of health, including mental health, the amount of illness discovered in a group of people depends to a large extent on the index of illness-wellness used. If, for example, one were to consider as ill, everyone who has ever had an illness of any kind, one would find the entire population ill. On the other hand, if only persons in hospitals were to be counted, the percentage of illness would be considerably less.

It follows that the specification of our criteria is particularly important if the results are to have meaning, and if valid comparisons between populations are to be possible. This topic cannot, unfortunately, be treated at the length it deserves within the space of an article, and, as a result, it will be necessary to rely largely on references to the Diagnostic and Statistical Manual of the American Psychiatric Association (1952).

In reporting our results, no attempt will be made to introduce speculative interpretations. It is hoped that the findings, as they stand, contribute something of interest regarding the total amount of psychopathology in a general population, including both that which has come to medical attention and that which has not.

Ours is by no means the first study of the mental health status of a population. One of the pioneering investigations was begun in 1935 in Williamson County, Tennessee², while another was

2. Roth, W.F., Jr., M.D., and Luton, F.H., M.D. "The Mental Health Program in Tennessee". Am. J. Psychiatry, Vol. 99, 1942-43, pp. 662-75.

made in the Eastern Health District of Baltimore in 1936³. The methods used differed from each other and from those we applied, so that very great caution is necessary in comparing the results. A third type of contribution stems from the study of mental illness in Selective Service registrants 1940-47⁴. This is even less comparable because of the limitations of age and sex and the special considerations dictated by the war emergency.

Other on-going studies of community mental health are being made in New Haven⁵, Syracuse⁶, and Wellesley⁷. Interesting material has also appeared regarding the communities of Hutterites⁸ in Alberta, Manitoba, Montana and South Dakota.

In Williamson County a one-day prevalence of both active and inactive cases of mental disorder in the population was found to be 69.4/1000. In Baltimore a yearly prevalence of cases on the active list at various agencies at some time during the year was found to be 60.5/1000. Selective Service figures show mental illness to be the sixth most common defect among the young men examined, with a prevalence rate of 55.8/1000.

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3. Lemkau, F., Tietze, G., and Cooper, M. "Mental Health Problems in an Urban District", Mental Hygiene, Vol. 25, 1941, pp. 624-66; Vol. 26, 1942, pp. 100-119; and Vol. 27, 1943, pp. 279-95. Also, Public Health Reports, Vol. 58, pp. 1909-27.
 4. Rowntree, L.G., et al. "Mental and Personality Disorders in Selective Service Registrants", J. Am. Med. Assoc., Vol. 128, 1945 pp. 1064-67.
 5. Redlich, F.C., Hollingshead, A.D., et al. "Social Structure and Psychiatric Disorders", Am. J. Psychiatry, Vol. 109, 1953, pp. 729-734.
 6. Grunberg, S.H., M.D., "Community Conditions and Psychoses of the Elderly", Am. J. Psychiatry, Vol. 110, 1954, pp. 688-696.
 7. Personal communications
 8. Eaton, J.W., and Weil, J.R. "The Hutterite Mental Health Study", Lennonite Quarterly Rev., Jan. 1951.

Our method differs considerably from the first two studies, though it is more comparable to the rural Williamson County Study than to the Baltimore investigation. Cases in Williamson County were located by enquiry from physicians, teachers, and local leaders and were then interviewed. The Eastern Health District limited its study to persons who sought agency help of some sort.

Method

Our initial approach was to conduct a search of the records of all hospitals commonly patronized by our population⁹, for information about all persons who had ever been hospitalized and for what reason. This included two local general hospitals, two metropolitan general hospitals, one veterans' hospital, and one mental hospital. Other sources were also tapped, such as reform schools, county homes and welfare agencies. Names of everyone who had an address in our county were collected, together with the diagnosis, where available, or reason for admission. Later these were sorted according to diagnosis into five different groups:

A. Those whose condition was almost certainly of psychiatric significance (all who had mental hospital records and any others where there was a psychiatric diagnosis of any sort).

B. Those whose diagnosis was probably of psychiatric significance (ulcers, colitis, allergic conditions, hypertension, "dyspepsia", etc.).

C. Those whose diagnosis might possibly have psychiatric

9. This part of the work was directed by Dr. James S. Tyhurst.

significance (exploratory operations, hysterectomies, thyroidectomies, neuralgias, chronic constipation, "not yet diagnosed", etc.).

D. Those with apparently no psychiatric overtones (appendectomies, amputations, childbirth, etc.).

E. Welfare cases.

The entire group of names totalled 609.

The next step was to take a census of the adult population of Bristol as of a given date. After this was done, the names of patients obtained from the records of the four metropolitan hospitals (two general, one veterans', one mental) were checked against it and everyone not a resident of Bristol on that date was eliminated. Finally, the patients falling in the A, B, and C categories were selected for further investigation. This reduced the number to ninety-four.

We then undertook to do a follow-up interview of each of these persons with a questionnaire which included questions on their health status, as well as on socio-cultural data. The material gathered made it possible to refine further the assignment of individuals to the A, B, C groups.

However, having done this, all we had accomplished was to increase our information about individuals whom we already knew were, or had been, sick. What we next needed to know was expressed in the question, "Are there any people (and if so, how many) in the population as a whole who are equally sick, but whose names we do not have on our lists?"

To answer this question, we drew a random sample (approximately 20%)¹⁰ from our adult census and interviewed the persons included, in much the same way as we had the people whose names had been listed in the institutional records. We hoped, by this means, to discover those who might not have sought medical or agency aid, but whose symptoms could be brought to light readily in an interview.

The interviewing was conducted by fifteen individuals, seven men and eight women. Two of the group were psychiatrists and helped with the training and supervision of the others. The remaining thirteen were all persons with experience in administering sociological types of questionnaires. During the interviews, enough time was available to permit a leisurely atmosphere and to give the respondents a chance to discuss both their symptoms and their life situation. The interviews ranged in duration from forty-five minutes to several hours.

The questionnaire form was made up of:

- A front sheet for identifying data
- Several general questions about health, illness and hospitalization
- A check-list of common adult diseases, including some usually classified as psychosomatic (gastro-intestinal, headaches, etc.). There was also space for marking time of occurrence, duration and severity.
- A series of selected questions covering some kinds of psychiatric symptomatology (trouble sleeping, mood, palpitations, nervousness, worry, etc.)

10. The intricacies of this sampling will be described in detail in a later publication. The sample was weighted toward including people in the role of male or female heads of households.

Then, because we wished to be able to relate state of health to socio-cultural factors, there were questions covering:

- Family health
- Misfortunes experienced
- Broken home
- Date of birth
- Extent and type of schooling
- Language and ethnic group identification
- Marital status and changes
- Place in the family
- Number of children
- Migration history
- Religious affiliation
- Occupational history and attitudes
- Details of housing and possessions

At the end, there was a page on which the interviewer could record his impression of the type and condition of the house, the attitude of the respondent and other evaluative comments.

When the questionnaires were completed, any pertinent information in the hospital records was added, and finally two general practitioners were interviewed regarding their knowledge of each of the individuals in the sample. Certain additional information was also added from sources well acquainted with the entire community.

As the folders on each individual in the sample were completed, the work of psychiatric evaluation began. After considerable experimentation we decided to forego any attempt to diagnose each person, but rather to deal explicitly in symptoms. This meant quite severe limitation in terms of dynamic implications but had the advantage of not carrying us beyond our data.

Eventually, we devised an evaluation sheet to provide essentially a summary of significant items in the records and a

clinical judgment of their nature and seriousness. A model of a filled-in form is attached¹¹.

The nomenclature used is that suggested in the 1952 Manual of the American Psychiatric Association, with the important modification that the terms are not diagnoses but short-hand ways of designating constellations of symptoms. In consequence, multiple terms are used for each record to do justice to the variety of symptoms, whereas the manual directs the use of only one term for whatever seems to be the principal difficulty. Our data often gave no indication as to which set of symptoms was the more important.

These evaluation sheets were prepared independently by four psychiatrists who knew the community. In addition, a spot-check was made by two other psychiatrists who were not acquainted with the community. Thus we had the benefit both of psychiatrists who knew the cultural and social context and of psychiatrists who were unacquainted with the community and so were free of such bias as might be inherent in this kind of intimacy. The latter provided, in short, an independent view.

11. See Figure 1, the following page.

Figure 1

Sample Evaluation Sheet

Mrs. K.

50 years

House #93-11

1. Findings

Indicative of Illness

(Respondent)

- a. Hay fever as a child.
- b. Severe upset stomach eight years ago.
- c. 'Used to be' bothered a lot by nervousness; couldn't stand noise.
- d. Rheumatism at age 15, serious.
- e. Has felt like nervous breakdown 1-2 times.
- f. Nervous breakdown at 18 after marriage.
- g. Sometimes tired mornings.
- h. Dizzy spells when younger.
- i. Cold sweats formerly, not now.
- j. Often sick headaches, better now.
- k. Sometimes loss of appetite.
- l. Sometimes worries a lot - finances.

(Respondent)

Indicative of Health

(Dr. A.)

(Dr. B.)

- a. Health has never affected the amount of work she does.
- b. She has only minor ills.
- c. Her health is good.

2. Comment

Item d. above probably refers to rheumatic fever.

Figure 1 (continued)

2. Symptom Patterns

A. Psychophysiological

1. Respiratory 003-580: Hay fever
Time: As a child.
Duration: Childhood or less.
Impairment: None.

2. Gastrointestinal 006-580: Severe stomach upset,
loss of appetite.
Time: Current.
Duration: At least 8 years.
Impairment: Minimal.

3. Headaches 00v-580:
Time: Current
Duration: Unknown
Impairment: Minimal

Total psychophysiological impairment: Minimal.

B. Psychoneurotic Reaction

1. Other 000-x0y: Nervous breakdown at 18,
general nervousness, fear of nervous breakdown,
dizzy spells, cold sweats, worry about finances.
Time: Current.
Duration: Since youth
Impairment: Minimal

4. Rating as a Symptom Carrier A

5. Total Impairment Minimal

(SIGNED) _____ M.D. (Date) _____

Besides listing and naming the symptoms, each psychiatrist rated the respondent on a scale of 4, as to whether or not he thought the individual showed symptoms significant of mental illness. This rating was similar to that made of the original hospital data as described early in this paper. On this scale:

A - meant that the individual showed symptoms that were almost certainly indicative of personality disorder.

(been in mental hospital or had a nervous breakdown, or described anxiety attacks, for example).

B - meant that the individual's symptoms were probably indicative of personality disorder (asthma, ulcer, hypertension, etc., and also cases where the symptoms suggested psychoneurosis or psychosis, but were too vague to warrant inclusion under A).

C - meant that the symptoms might possibly be indicative of personality disorder, a borderline category (a person who said he had "high blood pressure", but who gave no other symptoms and whose statement was not substantiated by the doctors).

D - meant that the record showed no evidence of any symptoms of psychiatric significance.

Another important judgment made by each evaluator was a rating of the degree of impairment related to each symptom pattern and also the degree of impairment suffered by the respondent from all his symptoms. This was, perhaps, the least

well founded of any of our judgments, since the data in the records were scant on this point. The scale specified in the APA Manual was used:

| | |
|----------|-------------|
| None | |
| Minimal | - up to 10% |
| Mild | - 10% - 30% |
| Moderate | - 30% - 50% |
| Severe | - Over 50% |

After preparing individual evaluation sheets, the four psychiatrists of the community met in conference, compared their sheets and agreed upon a final joint evaluation which represented the group's best judgment on all these points¹². The joint evaluations were compared with the sheets prepared by the two spot-checking psychiatrists. In case of disagreement, subsequent conferences were held with the latter until a unanimous rating was finally achieved. The individual sheets were kept, as well as the joint evaluations, so that variability studies could later be made.

Following this (beginning in February 1954) the results of evaluation were coded and punched, together with the socio-cultural data in each record. These have been put through the tabulating machines with results that will be discussed in part below.

With such a random sample, and with a questionnaire which included many questions on both physiological and psychiatric

12. These were attacked seriatim in groups, which meant that individual psychiatrists tended to modify their definitions in the process. An interesting study will be to trace the development of this evaluation process and also to estimate the loss of information that would be experienced by using fewer psychiatrists.

symptoms, one might expect to uncover a larger proportion of mental illness in the general population than when cases were found by enquiry from agencies and informants. As in Williamson County and Lutterite research, we included any psychiatrically significant symptoms reported for the person's life-span rather than limiting the investigation to those bothering him currently. Our reasons for doing this, rather than determining who actually showed psychiatric symptoms on our critical date, were as follows:

1. Psychiatric illnesses are less well delimited in time than are most physical illnesses. While it is possible to place relatively definitely an attack of appendicitis, for example, the onset of attacks of anxiety, or most other psychiatric conditions, is often so gradual that the symptoms are not noticed until they seriously interfere with functioning. Similarly, their disappearance is commonly gradual also, so that they may reach a tolerable level and cease to draw attention, even though they are still present. If a person says he "used to be" nervous, for example, he may mean he is not now as much troubled by nervousness as in the past, though his family might say he was still nervous. Moreover, a person who has experienced definite psychiatric symptoms at some time in his life, is usually considered a greater psychiatric risk than a person who has never done so.

2. Many people feel free to admit to psychiatric difficulties in the past but hesitate to claim them as present, even though they may in fact be continuing.

3. For our long-range purposes, namely, to relate environment

and mental illness, past psychiatric symptoms are just as useful as current ones, provided we know the corresponding environmental facts. It seemed more economical to collect symptoms of all periods and later eliminate those which occurred only in the past, if that seemed advisable, than to collect only current symptoms and perhaps wish later that we had a record of a person's total experience with such conditions.

In considering the figures, it is essential to note again that we are not rating people as in need of hospitalization, as could be done after a careful work-up in a clinic or in private practice. On the other hand, when a record reveals symptoms that are almost certainly psychiatric (A) and suggests at least 10-30% impairment (Mild) we do feel that the individual is almost certainly in need of some psychiatric help. Where the rating is (B), the degree of certainty is less, but there remains, in our opinion, a high probability.

Findings

Nearly half our sample group of adults (48%) showed A or B classification of psychiatric symptoms at some time in their lives and appeared to have been more than 10% incapacitated by them. An additional 17% also showed symptoms of the same general nature, but did not seem to have been significantly impaired. The estimate for total population of eighteen years and over gives a rate of the order of 480/1000.

Twenty-one per cent of the sample fell into the C (Borderline) category, while the remaining 14% were asymptomatic

as far as could be judged from our data.

Table 1

Distribution of Rating Categories, percent of Total Sample

| Type of impairment | Percentage |
|--|-------------|
| A, more than 10% impaired | 37% |
| B, more than 10% impaired | <u>11%</u> |
| A and B, more than 10% impaired | 48% |
| A, less than 10% impaired | 7% |
| B, less than 10% impaired | <u>10%</u> |
| A and B, less than 10% impaired | 17% |
| Total A and B, all degrees of impairment | 65% |
| Borderline (C) | 21% |
| Asymptomatic (D) | <u>14%</u> |
| | <u>100%</u> |

The wide-spread prevalence of psychiatric symptoms in our random sample, as contrasted with the smaller figures found in previous studies elsewhere, is not necessarily due to a greater degree of mental illness in our population than in the others, but may be due rather to our methods of investigation and our standards of evaluation.

Of the types of psychiatric symptom patterns found,

psychophysiologic reactions of all sorts were by far the most common, and were followed fairly closely by psychoneurotic symptoms. Far less numerous were personality trait disorders, sociopathic personality disturbances and mental deficiency¹³. Psychotic symptoms and evidences of brain syndromes played a very small part. The figures are as follows:

Table 2

Prevalence of Symptom Patterns. Percent of Total Sample^{##} Showing Various Patterns

| Symptom Pattern | Percentage |
|----------------------------|------------|
| Brain Syndrome | 3% |
| Mental Deficiency | 11% |
| Psychosis ^{###} | 1% |
| Psychophysiologic | 77% |
| Psychoneurotic | 58% |
| Personality Trait Disorder | 12% |
| Sociopathic Disturbance | 17% |

[#] Since many individuals showed more than one symptom pattern, there is much overlap and the total far exceeds 100%. This table should be read:

"Brain syndrome 3% No brain syndrome 97% etc."

^{##} These are only the frank psychoses. It is quite possible that mild or incipient psychoses were classified under some other heading, such as Psychoneurotic.

¹³. As noted previously, these terms are employed descriptively according to definitions given in the A.P.A. Manual.

A significantly greater proportion of women than men showed psychophysiological and psychoneurotic patterns, while more of the men showed mental deficiency. Such differences would occur by chance less than 1% of the time. The figures are as follows:

Table 3

Sex Differences Seen in Some Symptom Patterns
Percentage of Men and of Women Showing These Patterns

| Pattern | Females [#] | Males [#] |
|--|----------------------|--------------------|
| Psychoneurotic | 67.1% | 46.1% |
| Psychophysiological | 80.0% | 73.4% |
| Combined Psychoneurotic and Psychophysiological | 62.6% | 43.8% |
| Mental Deficiency | 6.4% | 15.6% |

[#] In this table, 100% is all the females or all the males, i.e.:

| | |
|--------------------|------------------|
| | Females |
| "Psychoneurotic | 67.1% |
| Not Psychoneurotic | 32.9%, etc....." |

The explanation for these differences is by no means self-evident and will not be discussed until after the full body of material has been further analysed.

The difference in the figures for mental deficiency is of interest in conjunction with Malzberg's analysis of male and female admissions to New York State Institutions for the feeble-minded, where he found a predominance of males¹⁴.

We believe that our estimation of mental deficiency is particularly crude since it is based largely on statements by physicians, interviewers' impressions, and the number of grades completed in relation to years spent in school. However, in the process of evaluation, an attempt was made by the four psychiatrists to be extremely conservative and to rate retardation only where the evidence was exceedingly persuasive.

An analysis of the records showing psychophysiological and psychoneurotic symptom patterns indicates a rather high tendency for coincidence of both types of pattern in a given individual, as indicated in the following table.

14. Malzberg, B. "Sex Differences in the Prevalence of Mental Deficiency". Am. J. Mental Deficiency. 1953-54, Vol. 58, p. 301.

Table 4

Comparison of Percentages of Individuals Showing
Psychoneurotic and Psychophysiologic
Symptom Patterns

| Psychoneurotic | Psychophysiologic | | |
|----------------|-------------------|-----|-------|
| | Yes | No | Total |
| Yes | 54% | 4% | 58% |
| No | 23% | 19% | 42% |
| Total | 77% | 23% | 100% |

It is rather striking that out of 58% of the sample who had psychoneurotic symptoms, 54% also had psychophysiological symptoms.

Of the thirty-four respondents presenting evidence of personality disorder, thirty-one also showed psychophysiologic symptoms. On the other hand, there was no significant relationship between the occurrence of psychophysiologic reactions and the other categories of symptoms - brain syndrome, mental deficiency, psychosis and sociopathy.

Not only is there a coincidence of psychophysiological and psychoneurotic patterns in a considerable proportion of our sample but the occurrence of multiple psychophysiological patterns shows an almost linear relationship with evidences of psychoneurosis.

Table 5

Relationship between Number of Psychophysiological Symptom Patterns and Presence or Absence of Psychoneurotic Symptoms[#]

| | Number of Psychophysiological Symptom Patterns per Individual | | | | | | | | | |
|-------------------------|---|------|------|------|-----|------|-----|-----|-----|--|
| Psychoneurotic Symptoms | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Present (%) | 8.5 | 41.7 | 54.3 | 70.4 | 75. | 88.9 | 100 | 100 | 100 | |
| Absent (%) | 91.5 | 58.3 | 45.7 | 29.6 | 25. | 21.1 | 0 | 0 | 0 | |

[#] There is some possibility that the recurrence of multiple psychophysiological symptoms in a record may have influenced the evaluators to regard such a person as psychoneurotic even if he did not describe marked psychoneurotic symptoms. Further study is needed to determine the extent of this possible contamination.

This suggests that, to a limited extent at least, one could form an estimate of the psychoneurotic potential of a population by making a survey of its psychophysiological complaints. It is also in line with the common statement that many of the patients who seek a physician's help for physiological complaints are mainly in need of psychiatric aid. In a recent study of men undergoing pre-induction examinations, it was also found that a large number of physiologic complaints on a questionnaire was common among those rejected by psychiatrists and among those who performed poorly during their first four months of Service¹⁵.

Additional Correlations

In addition to the findings reported above, a beginning has been made toward analysing correlations between psychiatric symptoms and certain sociological variables. We have preliminary tables showing comparison of ratings (A, B, etc.):

- For each of three age groups.
- For marital status.
- For French and English groups.
- For different religious denominations.
- For various occupational groups.
- For degrees of religious participation.
- For degrees of religious intensity.
- For various levels of living.

All of these remain in too preliminary a form to permit definitive reporting, but let us take the last named table as an example, since the level of living scale has been described in

15. Brodman K. et al. "The Cornell Medical Index-Health Questionnaire VII: The Prediction of Psychosomatic and Psychiatric Disabilities in Army Training". Am. J. Psychiat., 1954, Vol. 3, pp. 37-40.

another section of this report ¹⁶. Tabulating our random sample both by ratings as symptom carriers and by location on the scale of levels of living results in the following:

Table 6

Comparison of Ratings for Various Levels of Living.

| Level of Living | N | Ratings of Degree of Impairment | | | | Total |
|-----------------|------|---------------------------------|----------------------|------|------|-------|
| | | A and B mild [#] | B min. ^{##} | C | D | |
| Lowest 0,1,2 | (51) | 58.8 | 19.6 | 15.7 | 5.9 | 100% |
| 3 | (34) | 55.9 | 20.6 | 14.7 | 8.8 | 100% |
| 4 | (45) | 60.0 | 8.9 | 20.0 | 11.1 | 100% |
| 5 | (51) | 47.0 | 13.7 | 13.7 | 25.5 | 100% |
| 6 | (69) | 53.6 | 14.5 | 18.8 | 13.0 | 100% |
| Highest 7 | (33) | 36.3 | 24.2 | 18.2 | 21.2 | 100% |

[#] Includes all A's and all B's with 10% or more impairment.
^{##} Includes B's with less than 10% impairment.

16. See pp. 98-111, Part II, for a discussion of the meaning of "levels of living".

It will be noted that the difference between the various levels is rather slight until one comes to the change between level 6 and 7, at which point the difference between the two ends of the rating scale becomes more noticeable. While the contrasts are not striking, the trend is suggestive and in the expected direction.

The middle ranges of this table are not at all clear cut and show reversed trends in a number of places. This is probably due in part to the small numbers of individuals represented by each percentage. Work is already under way to determine how to combine these small groups into meaningful larger ones so that the resulting distributions will have greater significance. The number of times that such a distribution as is seen in Table 6 might occur by chance is calculated as approximately half the time, so that statistically it has little significance in its present form.

The extremes of the table, that is, the first and last columns and the top and bottom figures in these columns give the most marked contrast, especially in the D (asymptomatic) column. If we take these figures at their face value, it is evidently quite uncommon for a person living at the lowest level to be free of psychiatric symptoms. His chances are nearly four times as great if he enjoys the highest living level. When the first and last columns, that is the almost certainly psychiatric and the asymptomatic individuals, are taken as the entire group and their distribution among the levels of living are compared, then it appears that such a distribution would occur by chance only once

in ten times. Obviously much more work needs to be done on these figures before we can conclude either that the correlations exhibited are without meaning or that they are truly significant.

Summary

A preliminary report is presented of an epidemiological study of psychiatric symptoms in the adults of a town of approximately 3,000. The study was begun as an investigation of hospital admissions and was later broadened with a survey of a 20% random sample of the adults of the town, with supplementary interviews of local physicians and other informants.

The findings are offered as a contribution to the search for a more adequate grasp of the problem of total psychopathology in an 'average' population and of the relative distribution of different kinds of symptoms.

Only 14% of the sample group appeared symptom free. Thirty-seven per cent showed "virtually certain" psychiatric symptoms, with 10% or more impairment, and 7% showed "virtually certain" psychiatric symptoms but little or no impairment. An additional 21% showed "probable" psychiatric symptoms, half with significant impairment, half without. The balance of 21% were borderline cases.

Of possible types of symptoms, psychophysiologic and psychoneurotic were by far the most widespread and were significantly commoner in women than in men.

A start has been made at studying correlations between sociological variables and psychiatric symptomatology.

Conclusions

Our study tends to support the commonly held belief that some sort of psychiatric symptomatology is very widely distributed in the population, and that persons free of such symptoms throughout their lives are very much in the minority. Our data indicate that approximately half the sample had, at some time, symptoms of such a nature and severity that they warranted psychiatric care of some sort. Very few of them had received such care in the past or were currently under psychiatric treatment.

This is the first study reported to date where the investigation has been carried beyond the point of case finding by means of institutional record search or by means of informants, which is doubtless the reason why our figure for prevalence of psychiatric symptomatology - 480/1000 - is so much higher than what has been found before. It is no indication, we believe, that our population was more than usually subject to such disorders, but rather that we tapped many individuals who were equally unknown to institutions or to informed persons in the community as carriers of psychiatric symptoms.

It provides some basis for assessing the need for preventive and therapeutic psychiatry and to some extent, measures the challenge which modern living offers to psychiatrists and social scientists to discover better ways for people to get along in the present day world.