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May 4, 1972

Mrs. Ann Sadowsky
Research Administration Division
National Institute of Law Enforcement
and Criminal Justice
United States Department of Justice
Law Enforcement Assistance Administration
1100 Vermont Avenue, N.W., Room 308
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Dear Ann:

Please find enclosed the terminal report on Grant [redacted] "Forensic Epidemiology", which I have put together in Dr. Ervin's absence. The report describes the present design and structure of the Screening System developed during the past nine months. I should like to note that it is in initial form. At present it is being applied progressively to a single penitentiary of 150 inmates (Bridgewater Treatment Center) where past experience suggests we may continue to obtain real results. The system will very probably benefit from modification when it is applied elsewhere, and it may require trial at two or three sites before being suitable for general use. We would not expect this prototype to be taken as a final product.

There are some useful indications of the prevalence of medical disorders among penitentiary inmates in the attached publications, particularly the descriptions of studies organized at Framingham Women's Correctional Institution by Dr. Climent, Psychiatrist-Epidemiologist on our staff. He has been able to develop population tests which discriminate psychiatrically between groups with differing degrees of violence. These tests were initially used in the pilot study at Framingham, and he has developed them further in our work this year by applying them to several other populations. The results of this validation procedure are contained in Section B.1.

The Framingham study, which has not been widely reported so far, also shows a high prevalence of medical and psychiatric disorders (up to 14% of heart disease, and 9% psychosis) in the population available for study. Perhaps the most interesting finding is the relationship of violence in women to early maternal loss (this parallels an analogous finding on paternal loss in males noted by Dr. Rowe at Lewisburg); and a further connection of this violence to childhood hospitalization due to head injury.

The dermatoglyphics continue to show the same trend in females (decreased ridge counts and increase in arch patterns) as in the male prisons; and it is interesting to me to add that the latest genetic data show the occurrence again of sex chromosomal abnormality in one out of the six female cases so far analyzed cytogenetically (this time a 55-year-old 47/XXX "superfemale" alcoholic whose violence appears to be specifically related to ingestion of alcohol).

The main section of the report is made up in the form of a Prototype Manual which aims at giving you a picture of the Screening System as a uniform whole. Dr. Climent and I would find it valuable to discuss the details with you and any of your colleagues who are interested.

With best regards,

Lawrence Razavi, M.D.
Department of Neurosurgical Research

LR:m
Enclosure

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I N D E X

BOOK THREE

C. PUBLICATIONS

NEURO-RESEARCH FOUNDATION

LEAA Grant #NI-72-~~023~~-G (Successor to NI-71-151-G) "Forensic Epidemiology"

Senior Investigators: Frank Ervin, M.D.
Lawrence Razavi, M.D.

Terminal Report

This report covers work done to establish a Unit for screening prison inmates with medical disorders. It describes the production of a prototype screening system of psychiatric, psychological, genetic, neurophysiological and general medical tests for physical disorders related to habitually aggressive and violent behavioural illnesses in prison inmates. In the initial phase the plan has been to concentrate on those physical or constitutional measures which

1. have sound empirical bases

2. appear to have an *a priori* relationship to behavioural illness

3. offer a chance for improving mental illness by proper medical care as far as possible without the intrusion of irreversible custodial or medical procedures

4. are within the capacity of normally equipped penitentiary clinics with regard to the actual application of tests and collection of data: processing of materials and analysis are referred to a central laboratory.

The work has been done in three phases:

1. Incremental clinical application of tests singly and in combination to self-referred psychiatric patients attending a hospital clinic with a complaint of repetitive and impulsive violence.

2. Parallel validation of the tests at the epidemiological level on populations of normal, criminal and mentally ill (institutionalized) subjects.

3. Technical (laboratory and data processing) development aimed at integration of methods and data (up to now handled in isolation) into a general data base.

The report divides into

A. A prototype manual which contains

I. A list of tests, their description and purpose; methods of use (collection and recording of raw data).

II. Systems for coding and analysis of the data.

B. Technical addenda on the results of validation of the tests, and computer programs used for data processing. Examples of typical outputs are included as illustrative material.

The purpose of including details is to give concrete examples of time-consuming and essential, but too often disregarded, groundwork necessary for a multi-phase screening system. It cannot be emphasized too strongly that careful and cautious preliminary design and trial of such a complex system is absolutely necessary before it is used in general application for the collection of reliable and interpretable information on important socio-medical problems.

C. Publications: these contain in a discursive form the theoretical bases for this research and the practical results which may be obtained by its application to suitable penitentiary populations.

The problems encountered in this work have been:

1. Time consumption for

   1.1 The development of unambiguous questionnaires.

   1.2 Development of generalizable computer programs together with specific modifications in software tailored to each source of data, and their aggregation into an overall inventory.

   1.3 Design of logistics for combinations of tests, costing and practical integration in non-hospital premises.

2. Interpretation of the nature of this work and its objectives to outside "interests," particularly to those showing concern for neurosurgical treatment of behavioural disorders. While the screening tests aim at detection of a variety of disorders -- epileptiform, endocrine and genetic -- whose management is unrelated to surgery, it has been hard to escape the concern that they may lead to a diagnosis implying neurosurgical therapy, especially when they include tests of brain function and, particularly, the electroencephalograph. Much of this is caused by press misinterpretation of reports but it may be combatted successfully, as has been done in local penitentiaries, by considerate, careful and full explanation of the nature of the work to inmates undergoing the medical examination. So far cooperation by inmates, even the habitually antagonistic type, has been good. It may be simplest to establish the Screen as part of the routine examination performed on admission to prison. (This has the added epidemiological advantage that it allows measures of incidence to be made.)

3. Acquiring and guaranteeing full-time skilled and senior personnel to work in a multi-disciplinary team over the period of time required for the social and scientific results of the work to bear fruit. It is important to note that this research is being conducted on a chronic disease and the essential requirement is for sufficient observations to be made over

a period of time. The problem is analogous to the longitudinal study of factors entering into the aetiology of heart disease: for such studies, a well-established population study must be pursued by a properly integrated team of workers if worthwhile results are to be obtained which have bearing on prevention and therapy: the alternative approach is to select particularly high yield aspects of the problem and use the results obtained from successful conclusion of such studies to extend understanding of the overall implications of the work in the minds of the public and correctional agencies. This approach was, in fact, the one used in the disparate genetic, psychiatric and endocrine studies which were adopted as pilot projects for the current program, and there is no doubt that the results they produced defined the existence of specific medical problems hitherto undetected in prison inmates. The implication of these studies for rehabilitation, however, awaits the application of some combination of the individual tests, by units experienced in the laboratory and field reports of the work

PROTOTYPE MANUAL

A prototype manual of tests available for use in the program is described in the following sections. This manual has developed in the course of studies using psychiatric, psychological, genetic and neurophysiological tests on cases with aggressive emotional illness in prisons or attending hospital psychiatric services. This collation contains a system of tests currently applicable in our work at, for instance, Bridgewater State Treatment Center for Dangerous Sexual Offenders: it will be modified according to the particular needs of future special prison populations.

The design objectives of the tests aim to satisfy one or more of these requirements:

1. Simplicity and low cost
2. Proven value
3. Immediate applicability
4. Within the capacity of groups who have had experience in the design and management of prison studies.

Most of the tests are modifications of similar procedures used in the clinical diagnosis of behavioural disorder due to organic disease.

The need for modification of tests derives from:

1. The logistical problems incurred in the application to population surveys of a combination of tests formally used in individual clinical work. For example, blood samples are drawn both for chromosomal analysis and hormone assays: the former requires less than 10 ml., the latter up to 40. Both tests require at least one portion of unclotted blood, while the chromosome test in addition requires serum from 5 ml. of clotted blood, and the hormone assay requires that the sample be kept close to freezing temperature. In a survey that combines these techniques, 50 ml. of blood may be drawn all at once, but aliquots must be immediately transferred to separate containers which hold appropriate amounts of blood, clotted or unclotted, at normal or cold temperatures respectively.

Similar problems attend the adaptation of EEG tests which usually require tracings made during sleep: this may be difficult to achieve in the field, and may have to be replaced by a multi-lead analysis requiring computer assistance; also the application of a large series of psychometric questionnaires, which must be interspersed among other tests to avoid delay in the latter; and to allow respite between the questionnaires which themselves can lead to emotional variance if applied in unremitting sequence.

The logistical design and management of such combinations of tests and their application in the field requires time and trial.

2. The requirement that standardization be achieved to reduce replication error and hence to allow evaluation of all cases in a similar fashion without systematic error.

The need for a recording system depends on:

1. The ability of several centers' data to be processed centrally,

2. The collection, processing and recording of data to be done by semi-skilled technicians.

The need for computer programs based upon:

1. The problems of handling rapidly the analysis and cross-correlation of data taken in bulk from large numbers of individuals as opposed to a few or several items measured in one individual. The distinction here is in the measurement of population trends of several items, not all of which may be present in every individual contained in that population; as opposed to the integration of whatever measures, few or many, are available from a given individual in a clinical situation.

2. The problems of minimizing error due to fatigue or replication failure in human data processing as opposed to machine handling.

3. The protection of privacy of data obtained from patients at legal hazard.

The Manual is divided into two parts:

Part I contains information on
- a) The nature and purpose of the tests in use
- b) Methods of collection and recording of test data.

Part II is composed of technical addenda on
- a) Validation results from application of the tests to sample populations inside penitentiaries and outside,
- b) Computer programs for statistical processing.

The first part, therefore, is concerned with the collection and recording of materials and data, the second with their processing and analysis. It seems probable that the two functions can be separated in time and place: that is, tests can be applied and immediate results recorded at any prison(s), and the data then transmitted elsewhere for central processing.

Examples are given, in the first part, of completed forms and, in the second, of test data analyzed from such forms. Maximum use of computer processing is required for quantifiable data (Dermatoglyphic Analysis, CYBER Medical Examination) and least for qualitative data for which relatively few indices are obtained (Standardized Psychiatric Report, Affective Psychometric Tests). An overall list of tests is given in Table 1.

TABLE 1

TABULAR OUTLINE OF SCREENING TESTS

Test Title	Purpose: Measure of	Method. Requirements	Time
1. Initial Contact Assessment	Identity and Complaint Documentation	Preliminary Interview	10 minutes
2. Standardized Psychiatric Interview	Social-psychiatric Background and current mental status (quantified clinical evaluation)	1. Self-answered questionnaires 2. Summary abstract of above 3. Informed psychiatrist's opinion of above	Collection 30 min. Processing 1 hour
3. Affective Psychometric Analysis	Emotional status related to aggression	1. Self-answered questionnaires 2. Score computed from above 3. Comparison with normative data	Collection 40 min. Processing 1 hour
4. Dermatoglyphic Analysis	Fingerprint character (related to chromosomal constitution)	Print	1. Collection 30 min. 2. Processing 2 hours
5. Cytogenetic Analysis	Chromosomal constitution	Blood sample	1. Collection 30 min. 2. Processing 3 days
6. Electroencephalographic Analysis	Neurophysiological function	Scalpelectrodes	1. Collection 2 hours 2. Processing 1 1/2"
7. CYBER LAB	General medical condition	Automated module	1. Collection 45 min. 2. Processing 3 days

A.1. NATURE AND PURPOSE OF TESTS (Tests are listed in Table 1).

1.1 Before any tests are performed the subject is informed of the nature of the procedures to be undergone: these are detailed in entry forms and the Flow Sheet and Flow Chart (Section 2.1) which are also used by the Unit to check the progress of the subject through the Screen. A preliminary demographic and medical questionnaire is filled out, documenting the patient's identity and complaint.

1.2 Standardized Psychiatric Interview and Report (see Section 2.2 for form).

This provides a measure of the subject's psychiatric history and present condition. It is based upon standardized interview and questionnaire procedures which are designed to provide the same approach to all subjects. This reduces bias and permits real comparisons to be made with qualitative data, otherwise hard to quantify.

In this report items extracted from The Clinic Contact Form, The Interview Form and The Personal Background Form are inserted in the appropriate blanks in the matrix to yield the final "report to physicians."

An evaluation of mental status is provided by the Psychiatric Evaluation Form (PEF). Each area of the PEF has been amplified by affect and/or behaviour descriptors. In completing the PEF, the interviewer uses the PEF form to indicate severity of, for example, suicide tendencies, and the descriptive manual to detail symptomatology.

The physician's report is therefore based on objective data gathered in a standardized fashion. The only areas written in an unspecified fashion are the chief complaint and present history of the patient, the diagnostic impression, disposition and recommended treatment.

The report is divided into two parts: the Psychiatric and Social History, and the Current Mental Status.

1.2.1 The test questionnaires for Part 1 are described as follows (see section 2.2.1 for forms):

PRELIMINARY CLINIC CONTACT QUESTIONNAIRE

This questionnaire is to be filled out by the clinic at the time of initial contact. It is designed to provide identification data useful for administrative purposes and some basic medical data as well.

PERSONAL BACKGROUND QUESTIONNAIRE

This questionnaire consists of 50 questions which have been precoded in terms of a number of alternative answers

available to the patient. The questions concern the medical and family history of the patients. They deal with such content areas as: history of psychiatric illness, early signs of violence, family and personal evidence of physical illnesses that have genetic loadings, patterns of driving behaviour, criminal behaviour, social difficulties, and behaviour and symptoms associated with menstruation.

INTERVIEW QUESTIONNAIRE

The interview was developed to obtain information from the patients through the use of a structured interview. Some of the items are precoded and others are open-ended and they require a moderately skilled interviewer (a social worker, a psychologist or a psychiatrist). The content areas covered in the interview include: early childhood experiences, descriptions of parental behaviour, frequency of occurrence of family problems regarding school difficulties, violence within the family, marital problems, etc. At the end of the interview, the patient will be evaluated for the presence or absence of specific psychiatric symptoms. Evaluation will be based upon the Spitzer "Psychiatric Evaluation Form" (P.E.F.) This form covers such areas as social isolation, inappropriate affect, speech disorganization, grandiosity, agitation, etc.

A report is then made of the subject's Psychiatric and Social History which is abstracted from the three previous forms according to instructions followed by secretarial assistants (see Section 2.2)

1.2.2 Part 2 makes use of a Psychiatric Evaluation Questionnaire (see Section 2.2.2 for form) which documents current psychiatric systems elicited during interview and clinical observation of the subject by a trained observer.

1.3 Affective Psychometric Analysis (see Section 2.3 for forms).

These tests measure emotional status related to aggression, and use standardized questionnaires answered directly by the subject. No interview is necessary and this avoids mixed interpretation of emotionally variable responses. The elimination of the interviewer also reduces senior manpower requirements. The tests can be read by a skilled technician and scores made according to a simple formula. Since there are several questionnaires, some of which cross-check on each other, they are interspersed among the other procedures: this allows time for the subject to come to equilibrium at each stage of the process of measuring emotions.

The tests are as follows:

F-A-V QUESTIONNAIRE:

This questionnaire consists of 22 questions concerning feelings and acts of violence. The respondent is asked to indicate whether each description is true for him using a three-point scale: never true, sometimes true, or often true. An overall score is obtained which reflects an individual's tendency to act violently.

F-A-S QUESTIONNAIRE:

This questionnaire consists of 20 questions concerning sexual feelings and sexual behaviors. The respondent is asked to indicate whether each description is true for him using a three-point scale: never true, sometimes true, or often true. An overall score is obtained which reflects an individual's tendency to express his (her) sexual drive in overt forms.

PROBLEM CHECK LIST:

The problem check list is a modified version of the Mooney Check List, with an orientation towards more overt psychiatric problems, rather than toward the everyday problems of college students for which the test was originally designed. The test has a series of brief descriptions of problems which people sometimes have, for example, being overweight, being unable to hold onto a job, feeling afraid to speak up, confusion in religious beliefs, losing one's temper too easily, feeling rejected by one's family or embarrassment about sex. The items are actually grouped into a few major content areas: physical symptoms and problems, vocational difficulties, personal insecurities, difficulties over religious matter, difficulties in interpersonal relations, family problems, and sexual problems. This form is to be completed by the patient.

BARRATT SCALE:

This scale is based on the work of Ernest Barratt, a psychologist who has done a great deal of work in an effort to develop a psychometric index of impulsiveness. The scale consists of 20 statements about an individual's typical behavior, each to be answered as "Yes" or "No". The overall score is believed to be a measure of impulsiveness.

M-D SCALE:

This scale was developed as part of a long-term study of manic-depressive patients. It consists of 52 statements about an individual's typical behavior, each of which can be answered as "Yes" or "No". The items can be scored in terms of two categories: those items that discriminate depression from normalcy, and those items that discriminate mania from normalcy. Two scores are thus obtained, a depression score and a mania score.

MONROE SCALE:

This is based upon the work of Russell Monroe concerning episodic behavioral disorders and epilepsy. He reports that a review of his clinical records revealed 18 statements often made by patients with "epileptoid" impulsive disorders. These statements have been slightly modified and associated with a four-point frequency scale ranging from "never" to "often". A single overall score is obtained.

M-M SCALES:

These scales are a selection of items from the MMPI. The only two MMPI scales that seemed to have some relevance to the objectives of the research project are the Sc or schizophrenia scale and the Pd or psychopathic deviate scales. However, an examination of the items that comprised these scales indicated that very few had face or content validity for the defined scale, and that the scales were too long (e.g. the Sc scale alone had 78 items). Therefore, 20 items, having the highest face validities were selected from each scale and incorporated into this new form. In addition, all 15 items of the L or Lie scale were added. The result is a 55 item test based directly on the MMPI, which provides three scores, a Lie score, a schizophrenia score, and a psychopathic score.

EMOTIONS PROFILE INDEX:

This index consists of 12 affect words, such as affectionate, resentful, and obedient, which have been paired against each other in all possible combinations to produce 66 pairs. The 12 terms have been selected to sample all aspects of the trait or emotion language. Each term has then been coded to represent certain implicit emotional states which have been referred to as primary or prototype emotions in the theory proposed by Plutchik. The theory assumes that all emotions can be conceptualized as mixtures of two or more of eight primary emotions which have certain systematic relations to each other. Since each word on the EPI is scored for these emotion categories, whenever a patient makes a choice of one of the two items in a pair, he is building up a score on the primary emotions. The eight primary emotions have been labelled by the following general terms (with words in parentheses indicating the more familiar subjective aspect of the emotion): protection (fear), destruction (anger), incorporation (acceptance), rejection (disgust), orientation (surprise), exploration (expectation), reproduction (joy), and deprivation (sadness).

CATTELL CULTURE FAIR IQ TEST:

This test was developed as a way of assessing intelligence in individuals who may differ widely in cultural background. The test items do not use words at all. The person being examined is presented with diagrams which show a progressive series of changes. He is then required to select the final correct diagram from a number of choices. The test has been well standardized and requires only 12 minutes of testing time.

1.4 Dermatoglyphic Analysis (see Section 2.4 for forms).

This is a physical (anthropometric) measure of the patterns formed by sweat gland ridges on the hands and feet. They represent the embryological development of the skin surface in these regions. They are known to differ between sexes and races, but are unrelated to age. They exhibit specific variations in known genetic diseases including chromosomal abnormalities of the kind found in habitually aggressive offenders. They are also valuable as a screen for cases on whom (more expensive) chromosomal tests are likely to be valuable.

FINGERPRINT CLASSIFICATION

All fingerprint classifications attempt to group patterns in uniform, meaningful classes. Differences in fingerprint classifications are due to

1) the purposes for which the classification will be used,

2) the number of classes which is considered necessary by the classifier,

3) the factors which are considered important definers of pattern type, and

4) the evolution of fingerprint classifications.

The differences between the Henry-FBI classification of fingerprints and the medico-biological classification are mainly due to differences in purpose. The FBI system is intended for identification purposes, strict replicability, and with some modifications, ability to be encoded for computer retrieval. The medico-biological system is planned to be a quantifiable definer of body symmetry, to interpret the genetic and medical history of an individual, and to allow analyses of population statistics for genetic, epidemiological, and medico-demographic studies.

A classification system has been devised which satisfies most of the criteria for both FBI and biological purposes and which is essentially a modified version of the FBI's system so that the requisite medical information is also recorded. Both systems recognize the basic pattern types of arch, ulnar and radial loops, and whorls, but there are differences in the definition of tented arches, in the manner of counting ridges, and in the manner of arranging the order of pattern types.

The following are the FBI-Henry definitions of the pattern types:

Arch "In plain arches the ridges enter on one side of the impressions and flow or tend to flow out the other with a rise or wave in the center."

"There are three types of tented arches:

The type in which ridges at the center form a definite angle; i.e. 90°

The type in which one or more ridges at the center form an upthrust

The type approaching the loop type, possessing two of the basic or essential characteristics of the loop, but lacking the third."

Loop — The essentials of a loop are "a sufficient recurve; a delta (triradius); a ridge-count across a looping ridge."

Whorl — "The whorl is that type of pattern in which at least two deltas are present with a recurve in front in each."

In the medico-biological classification, the following obtain:

Arch — A pattern with no triradius

Loop — A pattern with one triradius

Whorl — A pattern with two triradii.

Accidentals are patterns with three or more triradii in both systems and are considered as whorls in both.

The definitions of the pattern types alone cause one major difference in the two systems -- in the biological system the pattern type called tented arch is classified with the loops, not with the arch group. Furthermore, the patterns which are called tented arches are defined somewhat differently due to differences in methods of ridge-counting.

The next major consideration in pattern classification is symmetry. The FBI system specifies symmetry for the loops by calling a loop ulnar or radial, and whorls are specified as inner, meet, and outer sub-types. The biological system is very similar, using the terms ulnar, symmetric, and radial to designate symmetry. In this sense, loops are sub-typed as ulnar loops, symmetric loops (tented arches of the FBI system), and radial loops; all three of these have only one triradius but differ in symmetry.

In the FBI system, whorls are sub-classified as inner, meet, and outer but because these terms are defined based upon the appearance of the printed pattern without regard to the hand, the ulnar-symmetric-radial designations of the biological system are reversed for the left hand. The following chart shows this:

FBI SYSTEM	BIOLOGICAL SYSTEM	
Either Hand	Right Hand	Left Hand
inner	radial	ulnar
meet	symmetric	symmetric
outer	ulnar	radial

The differences may be overcome by tracing from the right triradius to the left on a print of the left hand or by changing the FBI designation for the left hand.

In the FBI system, the whorl patterns are further subdivided into the plain whorl, the double loop, and the central pocket loop. This is essentially the same as the biological system except that the plain whorl type is subdivided into spiral and concentric whorls. All whorls are classified as ulnar, radial, or symmetric types.

Ridge-counting

In the biological system the first ridge-count is always the core itself, whereas in the FBI system neither the core nor the triradius is ever counted as the first ridge-count. This means that some patterns which would be classified by the FBI as tented arches are classified as ulnar or radial loops in the biological system. This change will not effect as many changes as the definition of the pattern type will. The biological system does not recognize the "spoiling of ridges" in which many patterns that are otherwise valid loops are classified as tented arches. It is mainly this characteristic which makes the FBI system difficult and requiring cross-referencing often, all of which would be unnecessary when the tented arch is considered as only a symmetric pattern with one triradius and no ridge-count.

Complex measures

Three complex measures of dermatoglyphic character have been developed as tests of organic (ectodermal) abnormality. These detect deviation from normal variation with respect to:

1. Sexual dimorphism
2. Bilateral and cephalo-caudad symmetry
3. Focal morphogenesis

The sample size required for detection of abnormal variation at each of these levels is smallest in sexual incongruity, intermediate in asymmetry and largest in focal malformation. So far the only measure for which the sample of data is sufficient is sexual dimorphism.

This measure is composed of four elements. Two show a characteristically sex specific dimorphic distribution in a sexually mixed sample of the general population: total finger ridge-count and finger pattern frequencies. The other two measures: total palmar a-b ridge count and total palmar $\angle atd$, are related to symmetry and local morphology. They are included because sexually dimorphic elements may be influenced by changes in symmetry or local morphology, and in small samples this influence may by chance become significant. The a-b ridge count and atd measures are included therefore to detect spurious promotion or reduction of sexual differences by chance differences between test and control samples due to a symmetry (the a-b ridge count) and local deformation due to age or usage (the $\angle atd$). As the significance tests show, no differences are seen in the last two elements: therefore differences found in the other measures may be interpreted as solely sex specific.

	Normal Variation*	
	Male	Female
Total finger ridge-count	144.98 (σ51.08)	127.23 (σ52.51)
Finger pattern frequencies (A,LU,LR,W)	4.3-61.5-5.9-28.3%	5.7-65.6-4.8-23.
Total palmar a-b ridge-count	83.04 (σ10.28)	83.01 (σ9.72)
Total palmar ∠atd	85.0 (σ15.3)	85.9 (σ15.7)

* Data from Holt, 1968, English subjects; Cummins and Midlo, 1943, English subjects.

1.5 Cytogenetic Analysis (see Section 2.5 for forms).

Cytogenetic analysis measures chromosomal constitution in various tissues. It can be used to determine sex (including intersexuality) and to detect genetic anomalies due to changes in number or structure of chromosomes.

Two methods of cytogenetic analysis are used: chromatin assay and chromosomal karyotypy.

1. Chromatin assay makes use of cells from the lining of the mouth or from blood films. The cells are stained with two stains, toluidine blue and quinacrine mustard, which selectively demarcate, inside the nucleus, the X-(female) and Y-(male) sex chromosomes respectively. In this way the number and frequency of sex chromosomes can be measured as follows:

XY	Male
XX	Female
XXY	
XYY	various types of intersex
XO	
etc.	

2. Chromosomal karyotypy makes use of blood cells which are grown in tissue culture. When these cells are in the process of division all the chromosomes become microscopically visible and available for enumeration and identification. The results of this test take longer to obtain than in chromatin examination, but provide in addition to a count of sex chromosomes, full data on the frequency of non-sex chromosomes and their structural appearance. Both these characteristics of genetic constitution may be found altered in mental illness.

The method used for chromosomal culture is described in Heuser and Razavi, Methods in Cell Physiology, IV, 1969.

Photographs of the chromosomes may be analyzed visually and the results statistically analyzed with computer assistance; an alternative approach is to scan the photographs electronically according to a program developed at the Stanley Cobb Labs by C. Freed.

Chromosome tests must be repeated because the proportion of cells affected may change over time.

1.6 Electroencephalographic Analysis (EEG)

This test measures electrical activity of the brain by placing electrodes on the scalp. The activity is related to neural function, and diagnostically useful variations are found in neurological diseases including epilepsy. Epileptiform EEG traces are sometimes found in habitually aggressive offenders.

Since the electrical activity of the brain is complex, changes with time or consciousness, and originates in many neural regions, some far below the surface areas immediately accessible to scalp electrodes, the data furnished by the EEG are usually suggestive rather than definitive and often require several tests taken at different times. The successful analysis of EEG data depends in part on the amount and detail of information available from multiple electrodes: hence there is benefit to be gained from computer processing.

1.7 CYBER LAB Medical Examination (see 2.6 for forms).

This group of tests aggregates a series of medical procedures routinely used in general clinical practice into a semi-automated battery applicable to a large series of individuals. They cover the following items:

Medical History -- responses to a standardized questionnaire covering past medical history and current condition

General Physical Measurements -- height, weight, skinfold thickness, etc.

Vital Signs -- temperature, pulse, blood pressure

Vision -- acuity, phoria, colour, stereopsis

Audiometry

Pulmonary Function

Electro-cardiography

Urine Analysis

Blood Chemistry

Hematology

The tests are applied by a skilled technician using standard questionnaires and instrumentation contained in a mobile module. Data from tests are recorded on computer memory and results printed automatically on a standard report form.

Extracts from CYBER LABS Inc. documentation follow:

VISION

To ease any tension that the patient may be feeling, the first tests performed are opthalmological measurements. Most patients will be familiar with vision testing from prior experience and the passive nature of the tests should eliminate some anxiety as well as give the patient and the examiner a chance to establish rapport. The instrument used is a Titmus Optical Company professional vision tester. The following tests are a part of a standard test set:

Visual Acuity

The acuity of distant central vision is measured on each eye separately and both eyes together, using the Landolt Ring technique. The data are reported in Snellen equivalents ranging from 20/200 to 20/13. The ability of each eye and of both eyes to focus on a near object is measured and reported in a similar fashion. Eyeglasses are used if the patient normally wears them and this is noted in the report. In addition, if the patient has difficulty in the individual eye tests, the untested eye may be occluded. Such occlusion will also be reported.

Color Vision

Selected Ishihara slides are used to test for deficiencies of color vision. Bold numerals are represented in dots of various tints set amid dots of the same size, but of tints which are readily confused by color-blind people.

Phoria

Vertical phoria testing measures, in terms of one-half prism diopter steps, the relative posture of the eyes in the vertical plane when all stimuli to binocular fixation are eliminated. Data are reported in prism diopters of hypophoria or hyperphoria. The lateral phoria testing is done both near and far and measures, in terms of one prism diopter steps, the relative posture of the eyes in the lateral plane. Results are reported as the number of prism diopters of esophoria or exophoria. The lateral phoria test is done as a near point and as a far point test because accommodation and convergence may introduce additional postural problems at the near point.

Stereo-Depth

> This test measures the patient's ability to judge relative distances when all clues except binocular triangulation are eliminated. The results are reported as the angle of stereopsis in seconds of arc (from 400 seconds to 20 seconds). These data can also be reported in Shepard-Fry Percentages.

In addition, tests for fusion, astigmatism and peripheral vision can be included in special series. Techniques other than the Landolt Ring technique are also available, at the option of the local Medical Director.

SPIROMETRY

Pulmonary function is assessed by the use of a Chemetron-NCG Pulmonary Function Indicator. This device measures the Peak Flow, the forced vital capacity (FVC) and the forced expiratory volume (FEV) in one second and three seconds. The data reported are FEV one second (FEV_1), FEV three seconds (FEV_3), total forced vital capacity (FVC), and the peak flow rate in liters per minute. The forced expiratory ratio (FEV%) is calculated as FEV_1/FVC. In addition, the predicted vital capacity (PVC) based on age, sex, height and weight is given for comparative purposes and the forced expiratory ratio is calculated as FEV_1/PVC.

FVC is partly a measure of an individual's age, sex, height and weight and partly a measure of the efficiency of the rib cage and lung in moving. "Restrictive" lung disease such as fibrosis or ankylosing spondylitis tends to decrease the FVC, while athletic training will increase it.

FEV is lowered by changes affecting airways resistance, particularly asthma and emphysema. It should be noted the FEV% varies much less in a normal population than the other parameters.

The pulmonary function test is repeated twice at this point in the examination and then again after audiometry. Test repetition is advised because optimum results appear to be dependent on patient familiarity with the test.

Flagging criteria are explained in the Cyberlab Physician's Handbook.

TONOMETRY

The intra-ocular pressure of each eye is measured using a Berkeley Mackay-Marg Electronic Tonometer. Asepsis is strictly maintained during this procedure. The generally accepted upper limit of normal range is 25 mm. mercury (there is no significant lower limit) and a measurement in excess of 25 mm. in either eye suggests the need for investigation by an ophthalmologist. Glaucoma is a major cause of blindness and is treatable and alterable if detected in the early stages of development. Such detection is accomplished in a satisfactory manner using tonometry.

AUDIOMETRY

Hearing is tested using the Tracor Rudmose ARJ-4A automatic audiometer. This is a discrete frequency von Bekesy audiometer which automatically records an individual's pure tone air conduction thresholds. Once the test has begun, it continues on without further attention or supervision. However, a test may be interrupted by the examiner or administered manually at any time.

The patient responds to the test by pressing a button during the period of time he can hear the pure tone signal and by releasing the button during the time he cannot hear the tone signal. While the button is depressed, the test tone stimulus decreases in level at the rate of 5 dB per second until the subject can no longer hear it. When he releases the button, the test tone stimulus increases in level at the same rate until the subject again hears the tone and presses the button. Every thirty seconds the audiometer automatically switches to another frequency. During the six-minute test both ears are tested separately at six frequencies covering the range from 500 - 6000 Hz.

The hearing thresholds for all the test frequencies are reported in the patient's summary report. If the hearing loss is greater than 30 dB at any frequency the value is flagged as abnormal. No allowance is made for the hearing loss which normally occurs with age (Presbyacusis).

ANTHROPOMETRIC MEASUREMENTS

Anthropometric measurements consist of the patient's height and weight, chest, waist, and calf measurements and two measurements of skinfold thickness: triceps and subscapular. Skinfold thickness is a measure of obesity and can be converted to percent body fat. The measurement is taken using a Lange Skinfold Caliper. Flagging is done based on standard actuarial tables.

VITAL SIGNS

The patient's blood pressure, pulse, and oral temperature are the vital signs measured. Oral temperature is measured using an IVAC electronic thermometer with disposable probe. Blood pressure and pulse rate are taken in the standard fashion using a Tycos sphygmomanometer and a stethoscope. The blood pressure is measured on both arms with the patient supine and immediately thereafter on the left arm with the patient sitting up. Significant differences in these measurements may be indicative of circulatory dysfunction.

The practice of making a sharp division between normal and abnormal blood pressures is arbitrary, since blood pressures follow a distribution curve, and vary with age, sex and other factors. Nevertheless, some line of demarcation is useful. In Cyberlab, any systolic pressure over 140 mm. or under 90 mm. is flagged as abnormal, except for people over fifty years of age, in which case 160 mm. is used as the upper normal bound. Any diastolic pressure outside of the range of 60 - 90 mm. is also flagged. Differences between systolic and diastolic pressures greater than 50 mm. and less than 20 mm. are also flagged. It should be emphasized, however, that the results are not necessarily abnormal. They could be abnormal and the flag is merely an indication to the physician who may want to pursue this finding in greater detail.

ELECTROCARDIOGRAPHY

A standard twelve-lead electrocardiogram is administered using a Burdick electrocardiograph. After the completion of all testing, the ECG tracing is mounted in the standard fashion using a Littman ECG Mounter. The data may then be handled in either of two ways, depending on the specific service purchased: 1) The ECG can be sent as part of the report to the referring physician in its raw form; or 2) The ECG can be sent with a morphological interpretation by a cardiologist. This interpretation must be modified by the referring physician in light of any medication that the patient is presently taking.

CLINICAL LABORATORY

As part of most procedures, blood will be drawn for biochemistry, hematology and serology. All laboratory procedures are performed by automated equipment. A twelve-channel sequential multiple analyzer (SMA-12) manufactured by Technicon, Inc. performs the following tests on a seven (7) cc. sample of serum: Total Bilirubin, Calcium, Cholesterol, LDH, Phosphate, Total Protein, Albumin, Uric Acid, SGOT, Alkaline Phosphatase, BUN, and Glucose.

Hematology tests are performed on a five (5) cc. blood sample using the Technicon SMA-7. The following measurements are made: Red Blood Cell Count (RBC), White Blood Cell Count (WBC), Hematocrit, and Hemoglobin. The red cell indices, MCV, MCH, and MCHC, are also calculated by the SMA-7.

The ART test is used for the serological diagnosis of syphilis. If the specimen is reactive to any degree, confirmatory tests are recommended. Like all laboratory tests, the result of this test can only be evaluated by the referring physician in the context of his clinical findings.

In addition to the above tests a standard urinalysis is also performed routinely. Urine pH, specific gravity, glucose, protein, occult blood, ketones, and microscopic analysis are included in this test procedure.

The major disorders which may yield abnormal results in the biochemical data include, but are not limited to: diabetes, endocrine disorder, collagen disease, renal disease, intestinal disease, malignancy, myeloma, gout, atherosclerosis, cardiovascular disease, liver disease, anemia, and primary polycythemia.

A.2. SYSTEMS FOR CODING AND ANALYSIS OF DATA

2.1. First Contact Forms and Flow Chart

LEAA-STUDY FIRST-CONTACT FORM

(to be filled out when subject ID no. is assigned)

Subject ID . . . . . [ ][ ][ ][ ][ ][ ] 1

Card type, card sequence, status code . . . . . [0][1][0] 7 [0][0][1] 10 [0] 15

Date of filling out this form . . . . . [ ][ ] 16 year [ ][ ] 18 month [ ][ ] 20 da

Basic information on subject:

Sex (1=male, 2=female, 3=other) . . . . . [ ] 22

Race (1=black, 2=white, 3=Spanish-speaking, 4=other) [ ] 23

Date of birth . . . . . 1 [ ][ ][ ] 24 year [ ][ ] 27 month [ ][ ] 29 day

Age estimate (use only if year of birth above not known, otherwise code 997) . . . . . [ ][ ][ ] 31

PLEASE DOUBLE-CHECK ID NO.

NOTE: Standard exception codes are not permitted on this form except for date of birth and age estimate. Either year of birth or age estimate must be a non-exception value.

Code Number _____

FLOW SHEET

Each administrator of a test or form is to indicate that it has been completed by initialing in the appropriate space.

	EXAMINER'S INITIALS
Consent Form	
Referral Release Authorization	
Authorization for Release of Medical Information	
Clinic Contact Form	
Personal Background Form	
Interview Form	
FAV Questionnaire	
FAS Questionnaire	
Problem Check List	
Barratt Scale	
Columbia M-D Scale	
Monroe Scale	
M-M Scale	
Emotions Profile Index	
Cattell Test	
Neurological Interview	
Neuro-Psychological Testing	
Medical Examination	
Skull X-ray	
Electroencephalogram	
A. Sphenoital EEG	
B. Activated EEG	
C. Repeat	
Urine Specimens	
Blood Sample No. 1	
Blood Sample No. 2	
Blood Sample No. 3	
Buccal Smears	
Picture	
Finger and Palm Prints	
Foot Prints	

	DATE	
Battery of Tests Completed		
Test Scoring Completed		
Disposition Completed		
Computer File Opened		

Code Number _____

CONSENT FORM

Given by (Mr.) (Miss) (Mrs.)_____ Date___/___/____

I understand that I have been accepted for evaluation by the Neuro Research Foundation as a part of an investigation of medical problems related to behavior. I agree to undergo the following tests:

a) a medical examination
b) three small blood samples
c) urine specimens
d) Buccal smears (i.e. saliva)
e) a picture taken of the naked body
f) finger prints, palm prints and foot prints
g) a brainwave examination
h) personality tests
i) an interview with a social worker about my background
j) an interview with a Medical Doctor

Nothing done in the examination is in any way dangerous, and the results of the study will be kept in the strictest confidence.

I agree to participate in the study described above.

_____
(Signature of Patient)

_____
(Signature of Witness)

Code Number _____

NEURO RESEARCH FOUNDATION INC.

AUTHORIZATION FOR RELEASE OF MEDICAL INFORMATION

Name of Patient _____ Date _____

Address _____ Unit No.: _____

_____ Date of Birth _____

I hereby authorize the Neuro Research Foundation to release my medical records to:

_____

_____

_____

Patient's Signature
(if under 21 – parent's signature required)

_____

Witness Office

INFORMATION TO BE SENT: _____

_____

Code Number _____

RECORDS RELEASE AUTHORIZATION

To: _____
(Doctor or Hospital)

_____
(Address)

I HEREBY AUTHORIZE AND REQUEST YOU TO RELEASE TO:
THE NEURO RESEARCH FOUNDATION INC.

The complete history records in your possession concerning my illness and/or treatment during the period FROM: _____ TO: _____

Name: _____ Date: _____

Address: _____

Signature of patient: _____ Witness: _____
(if under 21—parent's signature required)

TEST SCHEDULE AND MATERIALS

TIME: 9:00 AM

Rm. I. Receptionist:

Forms:
1. Consent
2. Referral Release
3. Authorization For Release Of Medical Imformation
4. Clinic Contact

TIME: 9:05 AM

Rm. II. Social Worker

1. Interview
2. Personal Background
3. F.A.V.
4. F.A.S.
5. Problem Check List

TIME: 9:40 AM

Technician Test Briefing

TIME: 9:45 AM

Rm. III. Dressing Room

Supplies:
1. Disposable Gowns
2. Disposable Shoes
3. Chair

TIME: 9:50 AM

Rm. IV. Lavatory (Urine Specimen)

Supplies:
1. Urine Specimen Containers
2. Paper Towels

TIME: 9:55 AM

Rm. V. Neurological Interview (HX. & Exam)

Supplies:
1. Neuro HX. & Exam Sheets
2. Reflex Hmr.
3. Tongue Blades
4. Otoscope
5. Oculometroscope
6. Pins
7. 2 pt. Discrim Set } Sens. Perception
8. Thermesthesiometer
9. Cotton Swabs
10. Vial Of Clove
11. Vial Of Peppermint } Olfactory
12. Vial Of Cocoa
13. Vial Of Tobacco

TIME: 10:15 AM

Rm. VI. Medical Exam. (MD)

Supplies:
1. Medical Forms
2. Sphygmomanometer
3. Stethoscope
4. Laryngoscope
5. Sterile Gloves (Rectal & Vaginal Exams)
6. Lubricants
7. Cotton Balls
8. Alcohol
9. Culture Tubes (Buccal & Vaginal Smears)

TIME: 10:35 AM

Rm. VII. Physiological Testing

*EEG:
1. Electrodes
2. EEG Paste
3. Sponges
4. Tongue Blades
5. ? Chloral Hydrate (Induced Sleep)
6. EEG Paper
7. Small Basin (H_2O)

AUDITORY FUNCTION:
1. Ear-Phones
2. Score Cards

TIME: 11:30 AM

Rm. VIII. Physiological Test (continued)

Visual Function: Score Cards

Exam To Include:
1. Vis. Fields
2. Acuity
3. Occ. Phoria
4. Nystagmus
5. Color Blind

Circulatory Function:

1. Temperature: Disposable Cov
2. Blood Pressure (Prone & Sta Sphygmomanometer
3. Pulse Rate
4. EKG: Alcohol Sponges

Blood Collection: (Three Sample

Supplies:
1. [illegible] VacuTainer/
2. [illegible] VacuTainer
3. Sterile Needles
4. Sterile Syringes
5. Cotton Balls
6. Alcohol
7. Band-aids

Analysis To Include:
1. Chem -SMA-12
2. Hemo -SMA-7
3. Serology
4. Drugs
5. Hormones

TIME: 12:00 Noon

Rm. IX. Dermatoglyphics

Supplies:
1. Fingerprint Paper
2. Fingerprint [illegible]
3. Fingerprint [illegible]
4. Desk and Chair

Exam To Include:
1. Palmprints
2. Footprints

Anthropometry: (Body Measurement & Photo

Supplies:
1. Skinfold Calipers
2. Tape Measure
3. Scales (weight & heigh)
4. Camera
5. Film
6. Rotary Disc.

TIME: 12:30 PM

CAFETERIA: LUNCH

**TIME: 1:00 PM

Rm. X Psychometric

Scales:
1. Barnett
2. Columbia H-D
3. Monroe
4. M.M.I.
5. Cattel Test
6. Emotions Profile

TIME: 2:00 PM

Rm. XI Psychiatric Interview

TIME: 4:15 PM

Laboratory: Technicians Preparing Blood Samples and Smears for Analysis

* SLEEP STUDIES:
1. Natural, At least 1 hour
2. Induced, 1 - 2 hours

** Technician with second patient

2.2.1 Standardized Psychiatric Interview and Report Forms

Code Number_____

INTERVIEW FORM

1. How many brothers and sisters did you grow up with? (The total number) _____

2. How many brothers do you have? _____ How many sisters do you have? _____

3. What was your birth position in the family order of births?

_____ (1) only child;
_____ (2) first born;
_____ (3) somewhere in the middle;
_____ (4) last born;
_____ (5) twin.

4. Were you an adopted child? (A)_____ Yes; _____ No. Or a foster child? (B) _____ Yes; _____ No.

5. Is your natural mother alive? _____ Yes; _____ No. If not, how old were you when she died? _____

6. Is your natural father alive? _____ Yes; _____ No. If not, how old were you when he died? _____

7. Were your parents divorced or separated? _____Yes; _____No. If "yes", how old were you when they first separated?

_____

8. Where did you spend the most time during your early life?

_____ (1) farm
_____ (2) small town
_____ (3) medium sized city
_____ (4) large city

9. With whom did you live during your first 15 or 16 years? (Check one or more).

_____ (1) both parents
_____ (2) mother only
_____ (3) father only
_____ (4) grandmother
_____ (5) grandfather
_____ (6) foster parents
_____ (7) stepmother
_____ (8) stepfather
_____ (9) adopted parents
_____ (10) institution
_____ (11) with different people at different times
_____ (12) other (explain) _____

10. What was your father usually like during your first 16 years? (Check one or more).

_____ (1) calm
_____ (2) angry
_____ (3) happy
_____ (4) mean
_____ (5) timid
_____ (6) affectionate
_____ (7) unhappy
_____ (8) stubborn
_____ (9) paid little attention to me

11. What was your mother like during your first 16 years? (Check one or more).

_____ (1) calm
_____ (2) angry
_____ (3) happy
_____ (4) mean
_____ (5) timid
_____ (6) affectionate
_____ (7) unhappy
_____ (8) stubborn
_____ (9) paid little attention to me

12. Generally speaking, how would you describe your personality in relation to your parents?

_____ (1) more like your father
_____ (2) more like your mother
_____ (3) about equally like both parents
_____ (4) not like either one
_____ (5) don't know, cannot judge

Code Number _____

INTERVIEW FORM

FAMILY PROBLEMS

Please indicate whether you or any member of your immediate family showed any of the behaviors listed, now or any time in the past.

		Yourself	Father	Mother	Brother or Sister	Child
1.	Learning problem at school	____	____	____	____	____
2.	Behavior problem at school	____	____	____	____	____
3.	Truancy (from school)	____	____	____	____	____
4.	Stealing	____	____	____	____	____
5.	Assaultive behavior	____	____	____	____	____
6.	Runaway (from home)	____	____	____	____	____
7.	Desertion	____	____	____	____	____
8.	Constant worries about health (Hypochondriasis)	____	____	____	____	____
9.	Severe depression	____	____	____	____	____
10.	Suicidal attempts	____	____	____	____	____
11.	Hyperactive behavior (restless, irritable, poor sleep, always on the go, etc.)	____	____	____	____	____
12.	Temper out-bursts	____	____	____	____	____
13.	Very suspicious and distrustful of other people					
14.	Drug addiction	____	____	____	____	____
15.	Other (specify)	____	____	____	____	____

Code Number _____

CLINIC CONTACT FORM

(To be typed in duplicate)

1. NAME _____

2. AGE ___ ☐MALE ☐FEMALE 3. DATE OF BIRTH _____ TODAY'S DATE _____

3. RACE: ☐White ☐Black ☐Oriental ☐Indian

4. ETHNIC BACKGROUND (What descent are your parents?)
[More than one category may be checked]

☐ African
☐ Anglo Saxon
☐ French Canadian
☐ German
☐ Irish
☐ Italian
☐ Jewish
☐ Latin American
☐ Polish
☐ Puerto Rican
☐ Other: Specify _____
☐ Unknown

5. RELIGION

☐ Catholic
☐ Protestant: (Specify Denomination) _____
☐ Jewish
☐ Other: (Specify) _____
☐ None

6. CURRENT ADDRESS _____
_____

TELEPHONE NUMBER _____

7. WHO REFERRED YOU?
NAME _____
RELATIONSHIP _____
HIS/HER ADDRESS _____
_____
HIS/HER TELEPHONE NUMBER _____

8. NAME OF FRIEND/RELATIVE YOU HAVE BROUGHT WITH YOU
RELATIONSHIP _____
HIS/HER ADDRESS _____
_____
HIS/HER TELEPHONE NUMBER _____

9. DO YOU HAVE BLUE CROSS?
☐Yes ☐No
BLUE CROSS NUMBER:

DO YOU HAVE BLUE SHIELD?
☐Yes ☐No
BLUE SHIELD NUMBER:

Code Number _____

CLINIC CONTACT FORM

(To be typed in duplicate)

1. NAME _____

2. AGE ____ ☐MALE ☐FEMALE 3. DATE OF BIRTH _____ TODAY'S DATE _____

3. RACE: ☐White ☐Black ☐Oriental ☐Indian

4. ETHNIC BACKGROUND (What descent are your parents?)
[More than one category may be checked]

☐ African
☐ Anglo Saxon
☐ French Canadian
☐ German
☐ Irish
☐ Italian
☐ Jewish
☐ Latin American
☐ Polish
☐ Puerto Rican
☐ Other: Specify _____
☐ Unknown

5. RELIGION

☐ Catholic
☐ Protestant: (Specify Denomination) _____
☐ Jewish
☐ Other: (Specify) _____
☐ None

6. CURRENT ADDRESS _____
_____

TELEPHONE NUMBER _____

7. WHO REFERRED YOU?
NAME _____
RELATIONSHIP _____
HIS/HER ADDRESS _____
_____
HIS/HER TELEPHONE NUMBER _____

8. NAME OF FRIEND/RELATIVE YOU HAVE BROUGHT WITH YOU
RELATIONSHIP _____
HIS/HER ADDRESS _____
_____
HIS/HER TELEPHONE NUMBER _____

9. DO YOU HAVE BLUE CROSS?
☐Yes ☐No
BLUE CROSS NUMBER:

DO YOU HAVE BLUE SHIELD?
☐Yes ☐No
BLUE SHIELD NUMBER:

CLINIC CONTACT FORM Code Number_____

10. ARE YOU EMPLOYED?

☐ Yes ☐ No

11. WHAT IS YOUR WEEKLY INCOME?

_____

12. WHAT IS YOUR SOURCE OF INCOME? (Check one or more).

☐ Self Employed
☐ Salaried Worker
☐ Disability Income
☐ Welfare
☐ Social Security
☐ Medicaid
☐ Medicare
☐ Pension
☐ Supported by Husband/Wife
☐ Supported by Family
☐ Supported by Others

13. WITH WHOM DO YOU LIVE? (Check one or more).

☐ Live Alone
☐ Live in Institution
☐ Live with Spouse
☐ Live with Parents
☐ Live with Other Relatives
☐ Live with Children
☐ Live with Brother or Sister
☐ Live with Others (Specify):

14. WHAT IS THE HIGHEST GRADE LEVEL YOU HAVE COMPLETED? _____

WHAT IS THE HIGHEST GRADE LEVEL YOUR MOTHER COMPLETED? _____

16. WHAT IS THE HIGHEST GRADE LEVEL YOUR FATHER COMPLETED? _____

17. HOW MANY ROOMS ARE THERE IN THE HOUSE OR APARTMENT WHERE YOU LIVE? _____

18. HOW MUCH IS YOUR MONTHLY RENT? _____

19. HOW OFTEN DO YOU GET COLDS?

☐ Hardly Ever
☐ Once a Year
☐ Every Few Months
☐ Every Few Weeks
☐ All the Time

20. HOW OFTEN DO YOU GET HEADACHES?

☐ Hardly Ever
☐ Once a Year
☐ Every Few Months
☐ Every Few Weeks
☐ At Least Once a Week
☐ Every Day

21. WHICH OF THE FOLLOWING DO YOU HAVE?

☐ High Blood Pressure
☐ Hearing Difficulty
☐ Heart Trouble
☐ Back Pains
☐ Fainting Spells
☐ Ulcers
☐ Diabetes
☐ Menstrual Problems
☐ Asthma
☐ Epilepsy
☐ Hives
☐ Anemia
☐ Colitis
☐ Acne
☐ Food Allergies
☐ None of Above

22. WHAT DRUGS HAVE YOU BEEN TAKING REGULARLY AT PRESENT?

☐ None
☐ Aspirin
☐ Sleeping Pills
☐ Tranquilizers
☐ Oral Contraceptives
☐ Marijuana
☐ Dope
☐ Other (List)

23. WHAT IS YOUR USUAL CONSUMPTION OF ALCOHOL?

☐ Never Drink
☐ Drink Occasionally with Friends
☐ Drink Just on Special Occasions
☐ 1 or 2 Drinks Daily
☐ Over 2 Drinks Daily
☐ Frequently Drunk

CLINIC CONTACT FORM Code Number_____

10. ARE YOU EMPLOYED?

☐ Yes ☐ No

11. WHAT IS YOUR WEEKLY INCOME?

_____

12. WHAT IS YOUR SOURCE OF INCOME? (Check one or more).

☐ Self Employed
☐ Salaried Worker
☐ Disability Income
☐ Welfare
☐ Social Security
☐ Medicaid
☐ Medicare
☐ Pension
☐ Supported by Husband/Wife
☐ Supported by Family
☐ Supported by Others

13. WITH WHOM DO YOU LIVE? (Check one or more).

☐ Live Alone
☐ Live in Institution
☐ Live with Spouse
☐ Live with Parents
☐ Live with Other Relatives
☐ Live with Children
☐ Live with Brother or Sister
☐ Live with Others (Specify):

14. WHAT IS THE HIGHEST GRADE LEVEL YOU HAVE COMPLETED? _____

WHAT IS THE HIGHEST GRADE LEVEL YOUR MOTHER COMPLETED? _____

16. WHAT IS THE HIGHEST GRADE LEVEL YOUR FATHER COMPLETED? _____

17. HOW MANY ROOMS ARE THERE IN THE HOUSE OR APARTMENT WHERE YOU LIVE? _____

18. HOW MUCH IS YOUR MONTHLY RENT? _____

19. HOW OFTEN DO YOU GET COLDS?

☐ Hardly Ever
☐ Once a Year
☐ Every Few Months
☐ Every Few Weeks
☐ All the Time

20. HOW OFTEN DO YOU GET HEADACHES?

☐ Hardly Ever
☐ Once a Year
☐ Every Few Months
☐ Every Few Weeks
☐ At Least Once a Week
☐ Every Day

21. WHICH OF THE FOLLOWING DO YOU HAVE?

☐ High Blood Pressure
☐ Hearing Difficulty
☐ Heart Trouble
☐ Back Pains
☐ Fainting Spells
☐ Ulcers
☐ Diabetes
☐ Menstrual Problems
☐ Asthma
☐ Epilepsy
☐ Hives
☐ Anemia
☐ Colitis
☐ Acne
☐ Food Allergies
☐ None of Above

22. WHAT DRUGS HAVE YOU BEEN TAKING REGULARLY AT PRESENT?

☐ None
☐ Aspirin
☐ Sleeping Pills
☐ Tranquilizers
☐ Oral Contraceptives
☐ Marijuana
☐ Dope
☐ Other (List)

23. WHAT IS YOUR USUAL CONSUMPTION OF ALCOHOL?

☐ Never Drink
☐ Drink Occasionally with Friends
☐ Drink Just on Special Occasions
☐ 1 or 2 Drinks Daily
☐ Over 2 Drinks Daily
☐ Frequently Drunk

Code Number _____

PERSONAL BACKGROUND

Instructions

These questions are about your medical and family history. Please answer each question as honestly as you can. Your answers will be kept in the strictest confidence.

1. Have you ever been on welfare? _____ Yes; _____ No.
2. If yes, how long and when? _____
3. Have you ever been in a mental hospital? _____ Yes; _____ No.
4. If yes, for how long and when? _____
5. If you were in a mental hospital, what was your diagnosis? _____

   _____
6. Have you ever seen a psychiatrist, psychologist, or social worker about your problems? _____ Yes; _____ No.
7. If yes, what were the problems? _____

   _____
8. When you were in grammar school and high school, did you ever have to go to the Guidance Counselor or Principal because of fighting? _____ Yes; _____ No.
9. Have you ever been arrested? _____ Yes; _____ No.
10. If yes, what was the charge? _____
11. Have you ever been in prison? _____ Yes; _____ No.
12. If yes, of what were you convicted? _____
13. Has any member of your family ever been in prison? _____ Yes; _____ No.
14. If yes, of what was he convicted? _____
15. Have any of your immediate family members ever been so physically violent that the police had to be called? _____ Yes; _____ No.
16. Did you ever seriously hurt a dog or cat or other animal when you were a child? _____ Yes; _____ No.
17. If yes, how often did this happen before the age of 10? _____ Rarely; _____ Occasionally; _____ Often.
18. Did you ever set fire to something in your house before the age of 10? _____ Yes; _____ No.
19. If yes, was the fire accidental or deliberate? _____ Accidental; _____ Deliberate.
20. Did you ever set fire to someone else's property (for example, a wastebasket, curtains, a building, animals, etc.) before the age of 10? _____ Yes; _____ No.
21. If yes, was the fire accidental or deliberate? _____ Accidental; _____ Deliberate.
22. Did you wet the bed after the age of five? _____ Yes; _____ No.
23. If yes, at what age did you stop wetting the bed? _____

Code Number_____

PERSONAL BACKGROUND

		NEVER	SOME-TIMES	OFTEN
24.	When you were a child, were you spanked by your father?	_____	_____	_____
25.	When you were a child, were you spanked by your mother?	_____	_____	_____
26.	When you were a child, did you get into fights with other children?	_____	_____	_____
27.	Did you ever observe your parents quarreling?	_____	_____	_____
28.	Did you ever observe your father hitting your mother?	_____	_____	_____

29. Which of the following terms best describe the neighborhood you lived in when you were a child? (Check one or more)

- ☐ (1) tenement houses
- ☐ (2) apartment houses
- ☐ (3) private attached homes
- ☐ (4) private separated homes
- ☐ (5) quiet
- ☐ (6) tough
- ☐ (7) mostly White
- ☐ (8) mostly Black
- ☐ (9) mostly Puerto Rican
- ☐ (10) mixed racial groups
- ☐ (11) mixed ethnic groups
- ☐ (12) a lot of crime
- ☐ (13) very little crime

30. Please indicate if any member of your immediate family, including yourself, has or had any of the following illnesses. (Immediate family includes: grandparents, parents, brothers or sisters and your children.)

	Illness	Which Relatives
A.	Diabetes	_____
B.	Migraine headaches	_____
C.	Heart disease	_____
D.	Cancer	_____
E.	Epilepsy (fits, seizures, convulsions)	_____
F.	Cleft palate (or hare lip)	_____
G.	Mental retardation	_____
H.	Alcoholism	_____
I.	Asthma	_____
J.	High blood pressure	_____
K.	Ulcers	_____
L.	Drug addiction	_____

31. Do you have a driver's license? ____Yes; ____No.

Code Number_____

PERSONAL BACKGROUND

		NEVER	SOME-TIMES	OFTEN
32.	Have you ever driven your car to relieve (work out) your anger?	_____	_____	_____
33.	Have you ever done any of the following without being caught?			
	a) speeding	_____	_____	_____
	b) drunken driving	_____	_____	_____
	c) hit and run	_____	_____	_____

34. How often have you been in trouble for each of the following?

	NUMBER OF TIMES			
	0	1	2	3 or more
a) speeding	—	—	—	—
b) drunken driving	—	—	—	—
c) accidents	—	—	—	—
d) hit and run	—	—	—	—

35. Have you ever had your license revoked because of trouble with the police? _____ Yes; _____ No.

36. Have you ever been in any of the military services? _____ Yes; _____ No.

37. Were you drafted? _____ Yes; _____ No.

38. Did you volunteer? _____ Yes; _____ No.

39. Did you volunteer for combat? _____ Yes; _____ No.

40. Were you ever court-martialed? _____ Yes; _____ No.

41. Were you in any other way disciplined? _____ Yes; _____ No.

42. What type of discharge were you given?

a) Honorable _____ Yes; _____ No.

b) Dishonorable _____ Yes; _____ No.

c) Medical _____ Yes; _____ No.

d) General _____ Yes; _____ No.

THE FOLLOWING QUESTIONS ARE FOR WOMEN:

43. How old were you when you first had your period? _____ Age.

44. Are your periods regular? _____ Yes; _____ No.

Code Number _____

PERSONAL BACKGROUND

45. Do you notice any of the following changes before or during your menstrual period?

	NEVER	RARELY	SOME-TIMES	OFTEN
a) Depression (feeling blue, crying spells)	____	____	____	____
b) Nervousness	____	____	____	____
c) Do you get more interested in sex?	____	____	____	____
d) Do you get less interested in sex?	____	____	____	____
e) Do you get more irritable?	____	____	____	____

46. Do you notice that just before your menstrual period you lose your temper to the point of:

a) Injuring people	____	____	____	____
b) Injuring animals	____	____	____	____
c) Damaging things	____	____	____	____

2.2.2 Current Mental Status Forms

INSTRUCTIONS FOR MENTAL STATUS

DIAGNOSTIC SUMMARY

FROM THE PEF

PSYCHIATRIC DESCRIPTION

PEF

(1) ORIENTATION

if some: The patient A/B/C/D/E

if none: The patient is oriented in time and space

(14) AFFECT

if some: The patient's affect/appearance/behavior was _____.

if none: The patient's affect, appearance and behavior were appropriate.

(2) ANXIETY

if some: He exhibits a _____ degree of anxiety associated with _____ _____ _____.

if none: He reports no feelings of anxiety.

(3) BELLIGERENCE - NEGATIVISM

if some: He has presented overtly hostile behavior in the past

if none: He has presented no overtly hostile behavior in the past.

(4) DEPRESSION

if some: The patient's remarks indicate a _____ depression associated with feelings of _____ _____ _____ as well as _____ _____ _____ (#II "physical symptoms).

if none: The patient's remarks indicate an absence of depression.

(5) RETARDATION-LACK OF EMOTION

if some: The patient shows a _____ degree of motor retardation (if checked) and a lack of emotional responsiveness in _____ _____ (facial expressions, speech, gestures)

if none: The patient's emotional responsiveness was adequate.

(6) SUICIDE-SELF MUTILATION

if some: The patient expressed I A/B/C II A

demonstrated ID

has I E, II E

if none: The patient reports no thoughts of suicide or self-mutilation.

(7) SOCIAL ISOLATION

if some: He reports a _____ degree of social isolation characterized by _____

if none: He reports no feelings of social isolation

(8) SOMATIC CONCERNS

if some: The patient is _____

if none: There is no evidence of somatic concerns to any major extent.

(9) AGITATION-EXCITEMENT

if some: Mr. _____ has displayed a _____ degree of agitation and excitement.

if none: Mr. _____ has displayed no agitation or excitement.

(10) and (11) SUSPICION - PERSECUTION: GRANDIOSITY, HALLUCINATION

#10 if some: The patient feels _____ _____ _____

#11 if some: He _____

#13 if some: The patient _____ _____ _____

#10, 11, 13 if none: The patient presents no evidence of delusions or hallucinations.

(12) SPEECH DISORGANIZATION

if some: His speech _____

if none: His speech is fully organized and his thinking is logical.

(15) ANTI-SOCIAL ATTITUDES; ACTS

if some: The patient reports that he A/B/C/D _____
The patient E - I

if none: There is no evidence of anti-social thinking or activities.

(16-16) ALCOHOL - NARCOTICS

#16 if some: The patient reports _____
#17 if some: The patient uses alcohol _____
#16 and 17 if none:
The patients is neither abusive of alcohol nor narcotics

(18) DAILY ROUTINE

if some: The patient _____

if none: The patient's performance of routine functions appears to be adequate.

(19) DENIAL OF ILLNESS

if some: Mr. _____

if none: Mr. _____ has insight into the nature of his problems associated with _____.

PSYCHIATRIC INSCRIPTION

Miss W _____ is oriented in time and space.

The patient's affect is flat.

She exhibits a mild degree of anxiety associated with feelings of apprehension, worry, anxiety, insomnia, restlessness, palpitations and perspiring.

She has presented overtly hostile behavior in the past.

The patient's remarks indicate a mild depression associated with feelings of sadness and hopelessness as well as insomnia and difficulty in concentrating.

The patient shows a mild degree of motor retardation as well as a lack of emotional responsiveness in her facial expressions, speech and gestures.

She reports no thoughts of suicide or self-mutilation.

The patient reports a minimal degree of social isolation characterized by feelings of rejection.

There is no evidence of somatic concerns to any major extent.

Miss W _____ has displayed a mild degree of agitation and excitement.

The patient's speech is fully organized and her thinking is logical.

She gives no evidence of hallucinations or delusions.

There is no evidence of anti-social activities or thinking.

The patient is neither abusive of alcohol nor narcotics.

The patient's performance of routine functions appears to be adequate.

Miss W _____ has insight into the problems associated with her epilepsy.

Psychiatric History Matrix

The phrasing used in this prototype replicates the phrasing used in the component questionnaires. As the secretary types the report, she refers to the respondent's test battery and fills in the blanks according to the respondent's answers.

The form has been ordered for sequential readability and explanatory words have been inserted to improve transition.

As the sample shows, the output for the Psychiatric History contains full detailed information, yet provides the physician with a compact report.

Psychiatric History

Past History:

Identification: Clinic Contact (1, 2, 3, 4, 5, 6, 7, 8, 11, 14)

Name:

Age:

Sex:

Race:

Religion:

Address:

Tel. No.:

Source of Referral:

Employment Status:

Past History as Follows:

#1 Interview form (1, 2, 3 4, 5, 6, 7, (9) if applicable, if not 9, 10, 11, 12)

#3 Mr. _____ was the (3) born of (5) children and has _____ brothers/sisters.

#9 The patient lived with _____during his childhood and adolesence.

#10 He describes his father as _____.

#11 and his mother as _____ and feels he is more like his _____.

OR

#4/7 The patient was an adopted child who lived with #9

#5/6 The patients 5/6 died when he was 5/6 and he lived with 9.

2) Personal Background: 24, 25, 26, 27, 28, 16, 17, 18, 19, 20, 22, 23

#24, 25: Mr. _____ was R/S/O spanked by his father and R/S/O spanked by his mother.

#27,28: He R/S/O observed his parents quarreling (27) and/but R/S/O observed his father hitting his mother.

Filled-in Example

The patient was the middle born of three children and has two sisters. Miss W lived with both parents during her childhood and adolescence. She describes her father as being calm, happy and affectionate, yet mean. She uses the same terms in describing her mother and feels she is more like her father.

Miss W was never spanked by her parents, although she frequently observed them quarreling. She reports that she sometimes got into fights with other children. She never injured an animal as a child or set fires, but she did wet the bed until age 12.

The patient states that her main problem is epilepsy and she has seen a psychiatrist because of this problem. With regard to family behavioral problems, Miss W characterizes her mother as hypochondriachal, severely depressed, hyperactive and ill-tempered. She also states that one of her sisters was truant from school, had a behavioral problem at school, has engaged in thievery, has run away from home and attempted suicide.

With regard to medical problems, the patient states that she has problems with epilepsy, acne, usually feeling tired, being underweight, not getting enough sleep, slurring of her speech and sometimes feeling faint or dizzy. She states that her menstrual periods began at the age of 11, are irregular and that she occasionally feels depressed, nervous and has lost her temper to the point of injuring people just before her period. The only medical problem in the family reported by Miss W is her mother's high blood pressure.

Code Number _____

INTERVIEW FORM

P-E-F SCALE

	Symptoms	Degree of Severity					
		None	Min	Mild	Mod	Sev	Ext
1.	Narcotics or Drugs use						
2.	Agitation-Excitement						
3.	Suicide-Self Mutilation						
4.	Grandiosity						
5.	Somatic Concerns						
6.	Antisocial Attitudes Acts						
7.	Speech Disorganization						
8.	Hallucinations						
9.	Social Isolation						
10.	Belligerence-Negativism						
11.	Disorientation-Memory						
12.	Alcohol Abuse						
13.	Anxiety						
14.	Inappropriate Affect						
15.	Suspicion-Persecution						
16.	Daily Routine-Leisure Time						
17.	Denial of Illness						
18.	Depression						
19.	Retardation-Lack of Emotion						
20.	Overall Severity of Illness						

Description of how PEF is completed

As the interviewer completes the PEF scale, he concurrently checks the descriptors listed in the PEF manual which was developed by our group to provide a standardized description of a patient's mental status.

In typing this report, the secretary refers to the PEF scale and notes degree of severity for a given item. She then checks the manual to see which descriptors have been selected. This information is then plugged into the psychiatric description prototype.

As an example, a patient has been rated as severely anxious (#13) in the PEF scale. In the manual, the words fearful and nervous have been circled as well as the physical symptoms of insomnia and restlessness. This information is inserted into the PEF prototype and reads: He (the patient) exhibits a sever degree of anxiety associated with nervousness, fear, insomnia and restlessness.

As with the psychiatric history report, the PEF matrix has been ordered for cogency and does not follow the order of the PEF scale.

2.3 Affective Psychometric Forms

Code Number_____

F-A-V QUESTIONNAIRE

Instructions

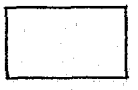
Here are questions about feelings of anger or acts of violence that you may have experienced in your life. Please answer each question as honestly as you can. Your answers will be kept in the strictest confidence.

	NEVER	SOME-TIMES	OFTEN
1. Do you find that you get angry very easily?			
2. Do small, relatively unimportant things make you angry?			
3. How often do you feel a little angry at people?			
4. How often do you feel very angry at people?			
5. How often do you feel a little angry about things? (For example: waiting at a traffic light, radio stops working, etc.)			
6. When you get angry, do you find that it is for no reason at all?			
7. When you get angry, do you let off steam at whoever is around?			
8. When you get angry, do you raise your voice?			
9. When you get angry, do you swear or yell at someone?			
10. When you get angry, do you hit something, (For example: the table), but do not damage or break it?			
11. When you get angry, do you break things? (For example a dish, lamp, T.V., etc.).			
12. When you get angry, do you make threatening gestures without touching? (For example: shake your fist at anyone)			
13. When angry, have you sent threatening notes or letters?			
14. When angry, have you threatened to hurt someone physically?			
15. When you get angry, do you spit or scratch?			
16. When you get angry, do you throw things at people?			
17. When you get angry, do you hit or kick anyone?			
18. When you get angry, do you become involved in fights?			
19. When you get angry, do you go and find a weapon?			
20. Have you ever used any of the following weapons?			
a) a stick			
b) brass knuckles			
c) broken glass			
d) a knife			
e) a gun			
f) other (what?)			

Code Number _____

F-A-V QUESTIONNAIRE

	NEVER	SOME-TIMES	OFTEN
21. Have you ever caused any of the following in a fight?			
a) bruises	____	____	____
b) bleeding	____	____	____
c) broken bones	____	____	____
d) unconsciousness	____	____	____
e) severe injury	____	____	____
f) death	____	____	____
22. Have you ever beaten your child?	____	____	____
23. Have you ever beaten your spouse?	____	____	____
24. Have you ever beaten any other member of your family?	____	____	____
25. Have you ever hit or attacked someone who is not a member of your family?	____	____	____
26. Have you ever carried a weapon?	____	____	____
27. Have you ever tried to use a weapon to harm someone?	____	____	____
28. Have you ever told anyone that you wanted to kill yourself?	____	____	____
29. Have you ever tried to hurt yourself?	____	____	____
30. Have you ever tried to hurt yourself by doing any of the following things?			
a) smash your fist against something	____	____	____
b) hit your head against something	____	____	____
c) cut yourself with a knife, razor or sharp object	____	____	____
d) jump from a high place	____	____	____
e) jump in front of a car	____	____	____
f) drive your car into a wall or tree	____	____	____



Code Number_____

(MOOD SCALE)

F-A-V QUESTIONNAIRE

The following words describe moods or feelings. Beside each word is a rating scale numbered from 1 to 5.

1. means you do not feel the mood at all.
2. means you feel the mood slightly.
3. means you feel the mood moderately.
4. means you feel the mood strongly.
5. means you feel the mood very strongly.

PLEASE DESCRIBE THE WAY YOU FEEL RIGHT NOW BY CIRCLING THE APPROPRIATE NUMBER NEXT TO EACH WORD. PLEASE MARK ALL EIGHT WORDS.

RIGHT NOW DO YOU FEEL	NOT AT ALL	SLIGHTLY	MODERATELY	STRONGLY	VERY STRONGLY
HAPPY	1	2	3	4	5
FEARFUL	1	2	3	4	5
AGREEABLE	1	2	3	4	5
ANGRY	1	2	3	4	5
INTERESTED	1	2	3	4	5
DISGUSTED	1	2	3	4	5
SAD	1	2	3	4	5
SURPRISED	1	2	3	4	5

Code Number_____

F-A-S QUESTIONNAIRE

Instructions

Here are questions about your sexual behavior and feelings. Please answer each question as honestly as you can. Your answers will be kept in the strictest confidence.

	NEVER	SOME-TIMES	OFTEN
1. Do you like to read sexy books?			
2. How often do you think about sex?			
3. Do you get sexually excited?			
4. Do you find that you get sexually excited very easily?			
5. Do you find yourself becoming sexually excited for no obvious reason at all?			
6. In general, how often do you have feelings of sexual excitement?			
7. Do you like to read dirty books?			
8. Do you like to look at dirty pictures?			
9. Do nude pictures sexually excite you?			
10. Do you like to think about sex?			
11. How often do you masturbate?			
12. How often do you have sexual relations with someone of the opposite sex?			
13. How often do you have sexual relations with someone of the same sex?			
14. Yesterday, how many times did you feel sexually excited for any reason at all?			
15. When you are sexually excited, do you talk about it?			
16. When you are sexually excited, do you try to find ways of getting satisfaction?			
17. Have you ever been so sexually excited that you felt you could rape someone?			
18. Have you ever attempted to rape someone when you were sexually excited?			
19. Have you ever felt so sexually excited that you picked up a stranger and had sexual relations?			
20. Have you engaged in prostitution?			

Code Number_____

PROBLEM CHECK LIST

Instructions

Here is a list of problems that people sometimes have. These problems deal with such matters as health, money, jobs, getting along with people, etc.

Please read through the list slowly and check (√) those problems which are troubling you *now*. Please answer each question as honestly as you can. Your answer will be kept in the strictest confidence.

If a problem is especially troublesome for you, place a double check (√√) alongside it. If the item listed is not a problem for you now, do not write anything.

DO YOU HAVE THESE PROBLEMS NOW?

Usually feeling tired	_____	Frequent headaches	_____
Being overweight	_____	Sometimes feeling faint or dizzy	_____
Being underweight	_____	Trouble with digestion	_____
Not getting enough sleep	_____	Trouble with constipation	_____
Sleeping too much	_____	Bothered by a physical handicap	_____
Being less healthy than I should be	_____	Poor appetite	_____
Frequent colds	_____	Overeating	_____
Slurring of my speech	_____		
			_____
Going into debt	_____	Fear of losing my job	_____
Too many money problems	_____	Can't hold onto jobs	_____
Needing to decide on a job	_____	Can't be trusted with money	_____
No steady income	_____	Can't handle money	_____
My job not satisfying	_____	Having no future	_____
			_____
Nervousness	_____	Worrying about umimportant things	_____
Getting angry too easily	_____	Moodiness	_____
Finding it difficult to relax	_____	Too easily discouraged	_____
Failing in many things I try	_____	Slow in reading	_____
Having bad luck	_____	Being talked about	_____
Being watched by other people	_____	Worrying about how I impress people	_____
Feeling inferior	_____	Daydreaming	_____
Unhappy too much of the time	_____	Afraid to speak up	_____
Forgetting things	_____		
Not knowing what I really want	_____	Having no one to tell my troubles to	_____
Finding it hard to talk about my problems	_____	Afraid of making mistakes	_____
Can't make up my mind about things	_____	Lacking self-confidence	_____
Bad dreams	_____	Thoughts of going insane	_____
Thoughts of suicide	_____	A guilty conscience	_____

Code Number _____

PROBLEM CHECK LIST

DO YOU HAVE THESE PROBLEMS NOW?

Can't forget some mistakes I've made . . . . . _____
Can't express my anger . . . . . _____
Feel like hurting other people . . . . . _____
Having no conscience . . . . . _____
Feeling that I'm going to steal something . . . . . _____
Can't make decisions . . . . . _____
Always making mistakes . . . . . _____
Feeling there is no place in the world for you . _____

Lacking self-control . . . . . _____
Can't concentrate . . . . . _____
Feeling too inhibited . . . . . _____
Keep thinking about the same thing all the time. . _____
Feeling I'd like to murder someone . . . . . _____
Can't make plans . . . . . _____
Being too impulsive . . . . . _____

Losing my earlier religious faith . . . . . _____
Not knowing what to believe about God . . . . . _____
Needing a philosophy of life . . . . . _____
I am losing my personal relation to God . . . . . _____
I can't think about God with happiness anymore _____
Confused in some of my religious beliefs . . . . . _____
Feeling that God wants to punish me . . . . . _____

Doubting the value of worship and prayer . . . . . _____
Science conflicting with my religion . . . . . _____
Not feeling as close to God as I used to . . . . . _____
Can't talk to God about my personal problems . . . _____
Confused on some moral questions . . . . . _____
Can't live up to my religious teachings . . . . . _____
Feeling there is too little religion in my life . . . . . _____

Being timid or shy . . . . . _____
Having no close friends . . . . . _____
Having feelings of extreme lonliness . . . . . _____
Being stubborn or obstinate . . . . . _____
Speaking or acting without thinking . . . . . _____
Having no hobbies . . . . . _____
Can't seem to get along with other people . . . _____

Being ill at ease with other people . . . . . _____
Not very attractive physically . . . . . _____
Getting into arguments . . . . . _____
Losing my temper . . . . . _____
Too little social life . . . . . _____
Feeling that people are prejudiced against me . . . _____
Feeling embarrassed by my religion or race . . . . . _____

Feeling I don't really have a home . . . . . _____
Not getting along with a member of my family. . _____
Arguments between me and my parents . . . . . _____
Arguments between me and my wife
(or husband) . . . . . _____
Not having any family . . . . . _____

Unhappy home life . . . . . _____
Unhappy marital life . . . . . _____
Feeling rejected by my family . . . . . _____
Parents don't understand me . . . . . _____
Wife (or husband) doesn't understand me . . . . . _____

Loving someone who doesn't love me . . . . . _____
Afraid of close contact with the opposite sex . . . _____
Disturbed by ideas of sexual acts . . . . . _____
Sexual needs unsatisfied . . . . . _____
Need to masturbate . . . . . _____
Thinking too much about sex matters . . . . . _____

Too inhibited in sex matters . . . . . _____
Embarrassed to talk about sex . . . . . _____
Needing information about sex matters . . . . . _____
Inability to achieve orgasm . . . . . _____
Fear of homosexuality . . . . . _____
Disinterest in sex . . . . . _____

Code Number_____

BARRATT SCALE

Instructions

Here are statements that describe the way some people feel or act. Please read each statement carefully and place a checkmark (✓) on the appropriate line to indicate how often you have felt or acted that way.

	SELDOM	SOME-TIMES	OFTEN
1. I am a careful person.	___	___	___
2. My interests tend to change quickly.	___	___	___
3. I am easily distracted.	___	___	___
4. I like work requiring patience.	___	___	___
5. I tend to arrange my life in an orderly way.	___	___	___
6. My friends consider me to be happy-go-lucky.	___	___	___
7. I like being where there is something going on all the time.	___	___	___
8. I like work that has lots of excitement.	___	___	___
9. I feel on top of the world.	___	___	___
10. As a youngster I liked playing risky games.	___	___	___
11. In watching games, I often yell along with others.	___	___	___
12. I like to work crossword puzzles.	___	___	___
13. It is easy for me to concentrate on my work.	___	___	___
14. I easily become impatient with people.	___	___	___
15. I think before I act.	___	___	___
16. I make up my mind quickly.	___	___	___
17. In the morning, I jump out of bed energetically.	___	___	___
18. I like doing things on the spur of the moment.	___	___	___
19. I become impatient waiting for traffic lights to change.	___	___	___
20. I like to take a chance just for the excitement.	___	___	___

Code Number _____

COLUMBIA M-D SCALE*

Instructions

On the following page there are statements describing how people sometimes feel. For each statement please indicate whether or not each of the statements applies to you. Simply put a check (√) under YES if it applies to you. If it applies to you only slightly or not at all, check (√) NO.

Please judge the statements on the basis of your feelings RIGHT NOW.

*This questionnaire was developed by R. Plutchik, Ph.D., S.R. Platman, M.D. and R.R. Fieve, M.D.

Code Number_____

COLUMBIA M-D SCALE

	Applies to you? YES	NO
I feel cheerful	____	____
I find it difficult to concentrate	____	____
I have stopped worrying about unimportant things	____	____
I move more slowly now than before	____	____
I feel like going on a spending spree	____	____
Most people find me dull	____	____
I have been making new plans for travel	____	____
I feel unable to do anything	____	____
I've been telephoning a lot of friends recently	____	____
I feel hopeless about the future	____	____
I don't need as much sleep as other people	____	____
I have stopped calling my friends	____	____
My health is excellent	____	____
I feel lost	____	____
I am constantly on the go	____	____
I find that I can't seem to do any work	____	____
I have an excellent memory	____	____
Time seems to be passing very slowly	____	____
I am continuously involved in activities	____	____
I need help in doing even simple things	____	____
I am annoyed by little things	____	____
I feel tired all the time	____	____
I feel like being with people	____	____
My memory is poor	____	____
I can do more than most other people	____	____
I feel worthless	____	____
I'm eager to see all my friends	____	____
I have lost interest in sex	____	____
I make up my mind quickly	____	____
I find myself worrying about trivial things	____	____
I am a very important person	____	____
I don't feel like talking much	____	____
I have boundless energy	____	____
I feel as if there is a great big weight on me	____	____
I feel hopeful about the future	____	____
I feel empty	____	____
I feel I can do anything by myself	____	____
I feel sad	____	____
I feel angry	____	____
I move faster now than before	____	____
I can't seem to make up my own mind anymore	____	____
I have no interest in food	____	____
I feel very alert	____	____
I cannot seem to do as much as most other people	____	____
Lately, I have been working much faster than usual	____	____
I find myself unable to organize my life	____	____
I feel that things will turn out well for me	____	____
I am no longer interested in my hobbies	____	____
People annoy me now more than before	____	____
Lately, I feel like breaking things	____	____

Code Number_____

MONROE SCALE

Here are statements that describe the way some people feel or act. Please read each statement carefully and place a checkmark (√) on the appropriate line to indicate how often you have felt or acted that way.

	NEVER	RARELY	SOME-TIMES	OFTEN
1. I have acted on a whim				
2. I have had sudden changes in my moods				
3. I have had the experience of feeling confused even in a familiar place				
4. I do not feel totally responsible for what I do				
5. I have lost control of myself even though I did not want to				
6. I have been surprised by my actions				
7. I have lost control of myself and hurt other people				
8. My speech has been slurred				
9. I have had "blackouts"				
10. I have become wild and uncontrollable after one or two drinks.				
11. I have become so angry that I smashed things				
12. I have frightened other people with my temper				
13. I have "come to" without knowing where I was or how I got there				
14. I have had indescribable frightening feelings				
15. I am so tense I would like to scream				
16. I have had the impulse to kill myself				
17. I have been angry enough to kill somebody				
18. I have physically attacked and hurt another person				

Code Number_____

M - M SCALE

Instructions

Here are statements that describe the way some people feel or act. Please read each statement carefully and place a checkmark (√) on the YES line if it applies to you, and on the NO line if it does not apply to you.

Please answer all the questions.

		YES	NO
1.	Do you feel you get a raw deal from life?	___	___
2.	Once in a while do you think of things too bad to talk about?	___	___
3.	Do you sometimes have fits of laughing and crying that you cannot control?	___	___
4.	Do you feel that no one seems to understand you?	___	___
5.	Do you sometimes feel like swearing?	___	___
6.	Do you prefer to pass by school friends, or people you know but have not seen for a long time unless they speak to you first?	___	___
7.	Do you find it hard to keep your mind on a task or job?	___	___
8.	Do you always tell the truth?	___	___
9.	Do you sometimes have a strong urge to do something harmful or shocking?	___	___
10.	Do you think that you would have been much more successful if people had not had it in for you?	___	___
11.	Do you read every editorial in the newspaper every day?	___	___
12.	Do you care what happens to you?	___	___
13.	Have you ever been in trouble because of your sex behavior?	___	___
14.	Do you get angry sometimes?	___	___
15.	Do you feel that you have often been punished without cause?	___	___
16.	During one period when you were a youngster, did you engage in petty thievery?	___	___
17.	Once in a while, do you put off until tomorrow what you ought to do today?	___	___
18.	Do you feel that there is something wrong with your mind?	___	___
19.	Do you feel you have not lived the right kind of life?	___	___
20.	Are you sometimes cross when you're not feeling well?	___	___
21.	Does your memory seem to be all right?	___	___
22.	Do you mind being made fun of?	___	___
23.	Are your table manners as good at home as when you are out in company?	___	___
24.	Does everything taste the same to you?	___	___
25.	Do you have many quarrels with members of your family?	___	___
26.	If you could get into a movie without paying and be sure you were not seen, would you probably do it?	___	___
27.	Do you have numbness in one or more regions of your skin?	___	___
28.	Are you happy most of the time?	___	___
29.	Would you rather win than lose in a game?	___	___
30.	Do you enjoy children?	___	___
31.	Do you feel that someone has it in for you?	___	___
32.	Do you like to know some important people because it makes you feel important?	___	___
33.	Do you wish you were not bothered by thoughts about sex?	___	___
34.	Were you sometimes sent to the Principal for cutting up in school?	___	___
35.	Do you like everyone you know?	___	___
36.	Do you dislike having people near you?	___	___
37.	Do you think that other people are responsible for most of your trouble?	___	___
38.	Do you gossip a little at times?	___	___
39.	Have you had very peculiar and strange experiences?	___	___

Code Number _____

M - M SCALE

		YES	NO
40.	Do you believe that your home life is as pleasant as that of most people you know?	____	____
41.	At elections do you sometimes vote for men about whom you know very little?	____	____
42.	Did you like school?	____	____
43.	Do you laugh at a dirty joke once in a while?	____	____
44.	Do peculiar odors come to you at times?	____	____
45.	Have you used alcohol excessively?	____	____
46.	Do you like to talk about sex?	____	____
47.	Can you keep your mind on one thing?	____	____
48.	Are your relatives nearly all in sympathy with you?	____	____
49.	Do you have very few fears compared to your friends?	____	____
50.	Do you often feel as if things were not real?	____	____
51.	Have you ever been in trouble with the law?	____	____
52.	Do you have more trouble concentrating than others seem to have?	____	____
53.	Do people say insulting and vulgar things about you?	____	____
54.	Do you feel lonely much of the time even when you are with people?	____	____

L	
Pd	
Sc	

Code Number _____

EMOTIONS PROFILE INDEX

Name _____ Date _____

Age _____ Sex _____ Marital Status _____

Education Completed _____ Occupation _____

INSTRUCTIONS

On the following pages, you will find pairs of words which describe people; words such as *adventurous, affectionate* and *cautious*. From each pair, choose the word that best describes you and *circle it*. Sometimes it may be difficult to decide which word in a pair fits you better, but try to make the choice even if the difference is slight.

Definitions of all the words are given on the last page. Please look at them before beginning.

This index was developed by Dr. Robert Plutchik, Albert Einstein College of Medicine, Bronx State Hospital, Bronx, New York and Dr. Henry Kellerman, Postgraduate Center for Mental Health, New York, New York.

Code Number_____

EMOTIONS PROFILE INDEX SCORING SHEET

Emot.	Raw Score	Stand. Score
1-Inc.		
2-Ori.		
3-Pro.		
4-Dep.		
5-Rej.		
6-Exp.		
7-Des.		
8-Rep.		
9-Bias		

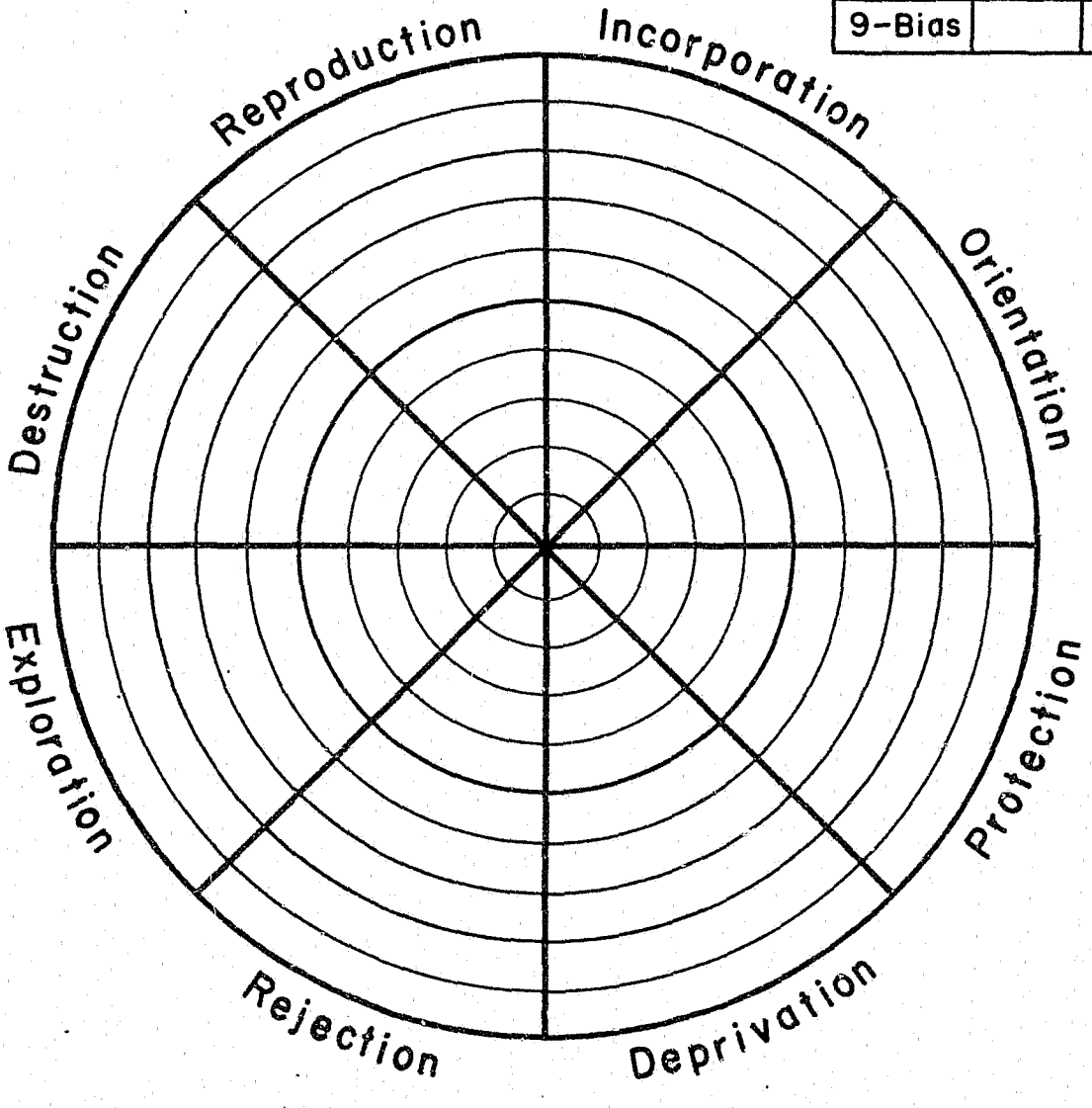
Name: _____

Date: _____ Age: _____ Sex: _____

Marital Status: _____

Education Completed: _____

Occupation: _____



Comments:

Code Number _____

	1	2	3	4	5	6	7	8	9
Affectionate	( )							( )	
Adventurous		( )				( )			
Resentful					( )		( )		
Shy			( )			( )			( )
Impulsive							( )		
Adventurous						( )			( )
Gloomy				( )					
Resentful					( )				
Impulsive		( )					( )		
Cautious			( )			( )			( )
Brooding				( )			( )		
Cautious			( )			( )			( )
Adventurous		( )				( )			
Sociable	( )							( )	( )
Affectionate	( )							( )	( )
Impulsive		( )					( )		
Adventurous		( )				( )			( )
Gloomy				( )			( )		
Cautious			( )			( )			( )
Resentful					( )		( )		
Quarrelsome					( )		( )		
Obedient	( )		( )						( )
Obedient	( )								( )
Shy						( )			
Sociable	( )							( )	( )
Self-Conscious					( )	( )			
Adventurous		( )				( )			( )
Resentful					( )		( )		
Self-Conscious						( )			( )
Resentful							( )		
Self-Conscious						( )			( )
Quarrelsome							( )		

	1	2	3	4	5	6	7	8	9
Quarrelsome					( )		( )		
Shy			( )			( )			( )
Impulsive		( )					( )		
Sociable	( )							( )	( )
Adventurous		( )							
Cautious			( )						( )
Shy			( )			( )			( )
Brooding				( )			( )		
Sociable	( )							( )	( )
Cautious			( )			( )			
Resentful					( )		( )		
Obedient	( )		( )						( )
Self-Conscious					( )	( )			
Obedient	( )		( )						( )
Cautious			( )			( )			( )
Affectionate	( )							( )	( )
Shy			( )			( )			
Gloomy				( )					
Quarrelsome					( )				
Gloomy				( )			( )		
Affectionate	( )							( )	( )
Cautious			( )			( )			
Quarrelsome					( )		( )		
Affectionate								( )	
Obedient			( )						( )
Adventurous		( )							
Self-Conscious					( )				

	1	2	3	4	5	6	7	8	9
Gloomy				( )			( )		
Obedient	( )		( )						( )
Impulsive		( )							( )
Gloomy				( )					
Resentful					( )				
Impulsive		( )							( )
Self-Conscious					( )	( )			
Affectionate	( )							( )	( )
Affectionate	( )							( )	( )
Brooding									
Shy							( )		
Adventurous		( )							( )
Impulsive		( )							( )
Quarrelsome					( )				
Gloomy				( )					
Shy							( )		
Obedient	( )								
Cautious						( )			
Sociable	( )							( )	( )
Resentful							( )		
Quarrelsome							( )		
Brooding									
Obedient	( )								( )
Impulsive		( )							
Obedient									
Sociable								( )	

	1-In	2-Or	3-Pr	4-Dp	5-Re	6-Ex	7-Ds	8-Rp	9-Bi
Total Score									

DEFINITIONS

ADVENTUROUS:	Someone who often tries new activities for excitement.
AFFECTIONATE:	Someone who often shows his warmth and love for others.
BROODING:	Someone who silently stews with anger and keeps it to himself.
CAUTIOUS:	Someone who is usually careful because he is afraid of what might happen to him.
GLOOMY:	Someone who mopes around and feels in a sad and dark kind of mood.
IMPULSIVE:	Someone who usually acts on the spur of the moment because of an urge, without thinking of the consequences.
OBEDIENT:	Someone who will usually do what he is told, without objecting.
QUARRELSOME:	Someone who often starts arguments.
RESENTFUL:	Someone who walks around with a "chip on his shoulder" and is easily made angry.
SELF-CONSCIOUS:	Someone who usually worries about other people's opinion of him when he is with them.
SHY:	Someone who usually feels timid with other people and in new situations.
SOCIABLE:	Someone who is friendly and who usually likes to be with other people.

Test of "g": Culture Fair

SCALE 3, FORM A

Prepared by R. B. Cattell and A. K. S. Cattell

Name _____ Sex _____
First Last (Write M or F)

Name of School (or Address) _____

Today's Date _____ Grade (or Class) _____

Date of Birth _____ Age _____
Month Day Year Years Months

Test	Score	Remarks
1		
2		
3		
4		
		Total Score

M. _____

Q. _____

1963 Edition

CF3-A1b-6A

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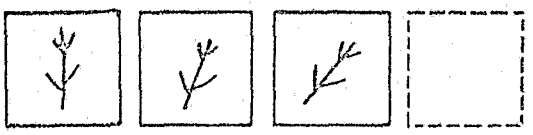

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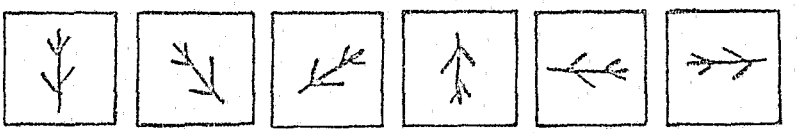

Answers

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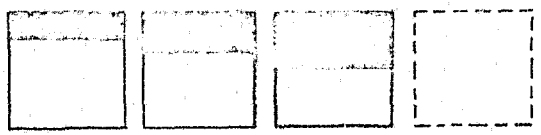

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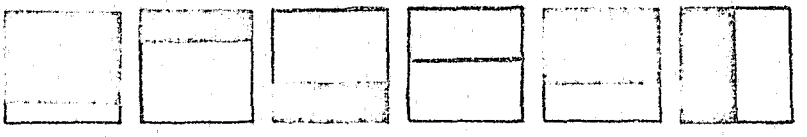

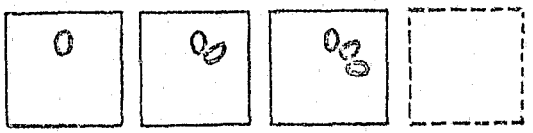

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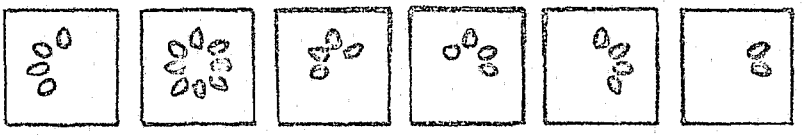

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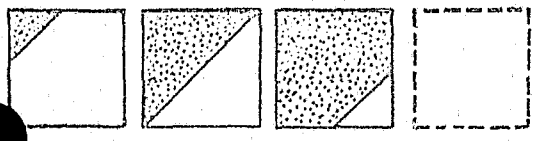

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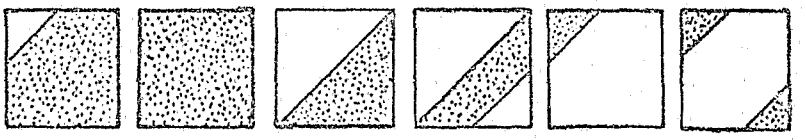

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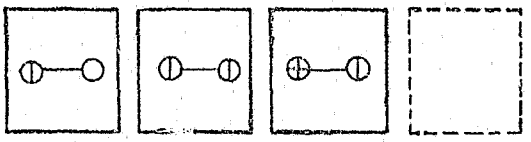

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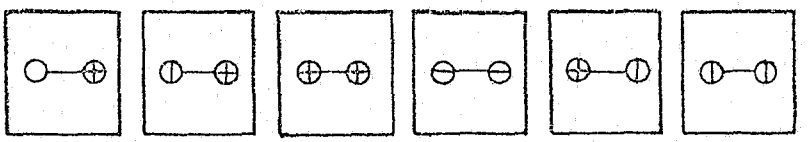

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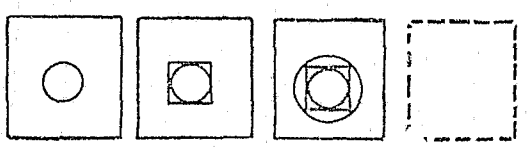

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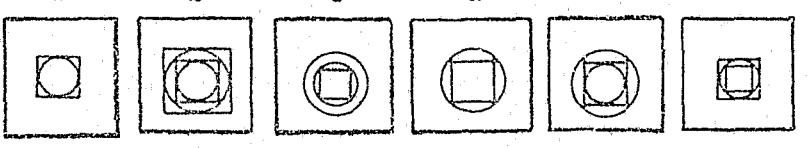

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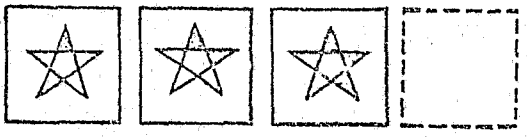

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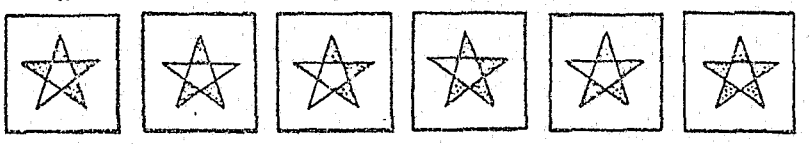

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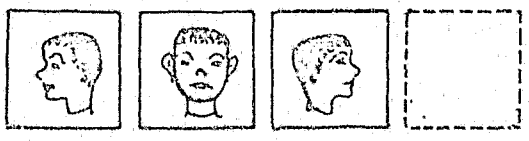

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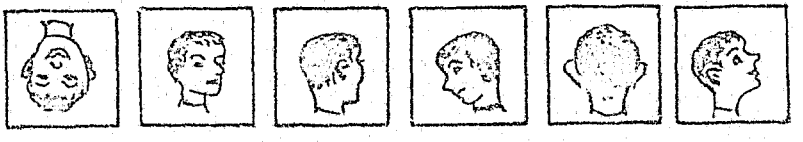

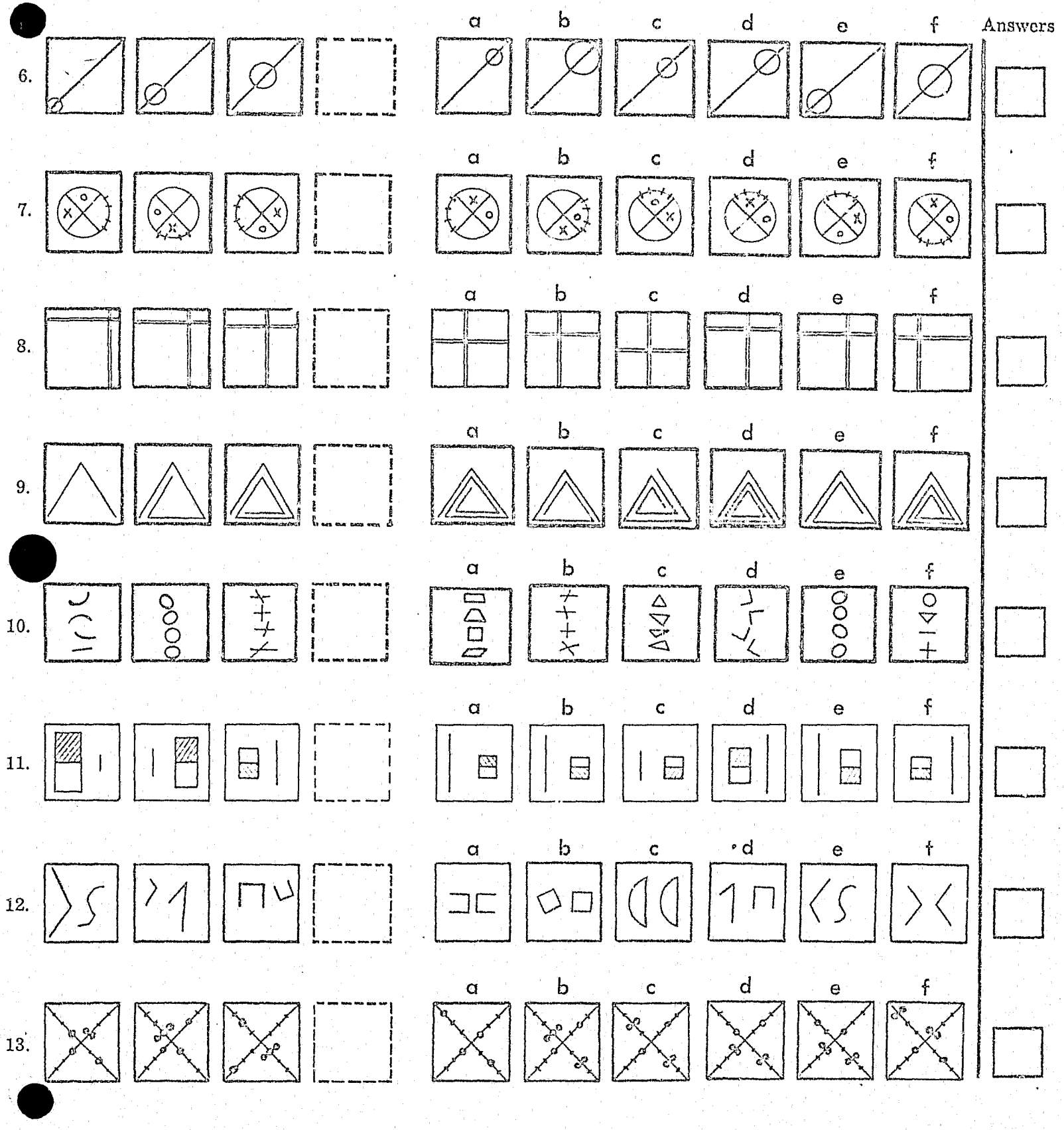

End of Test 1

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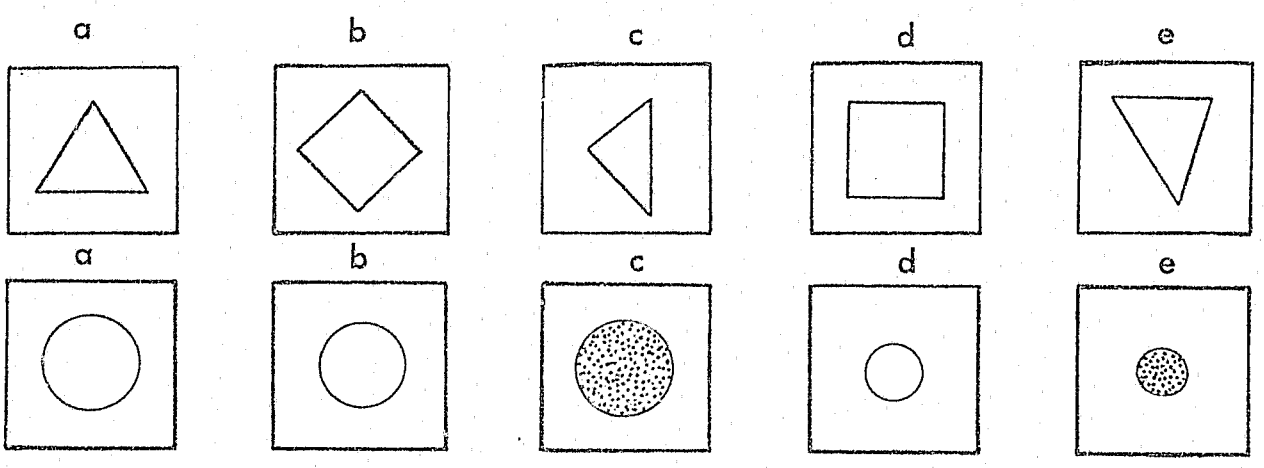
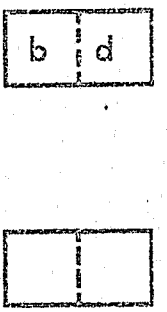


Answers



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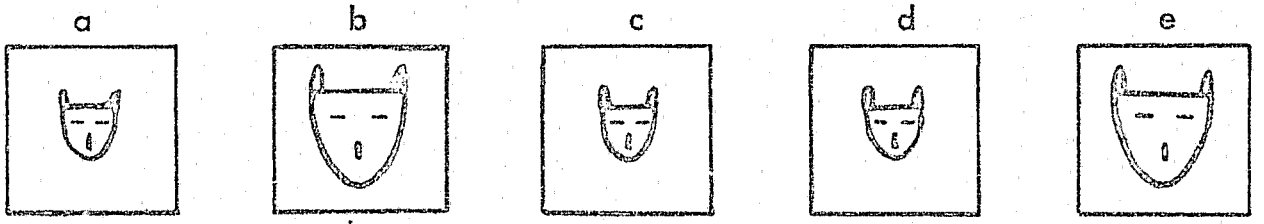

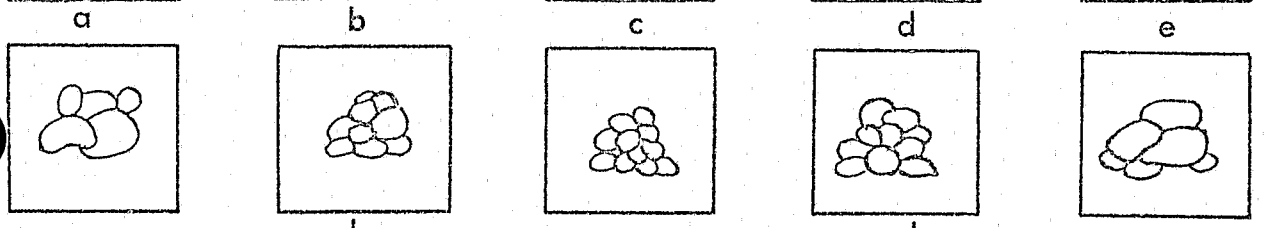

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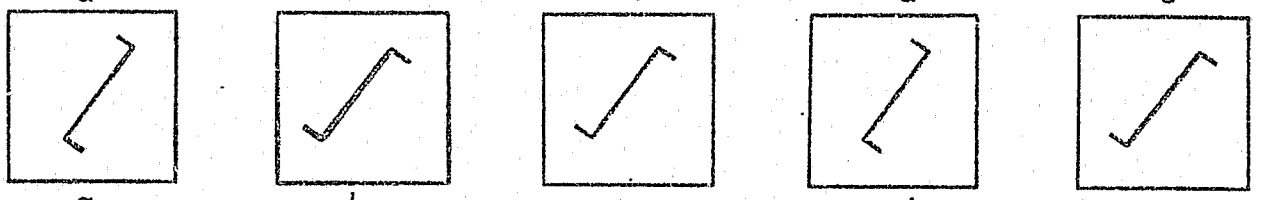

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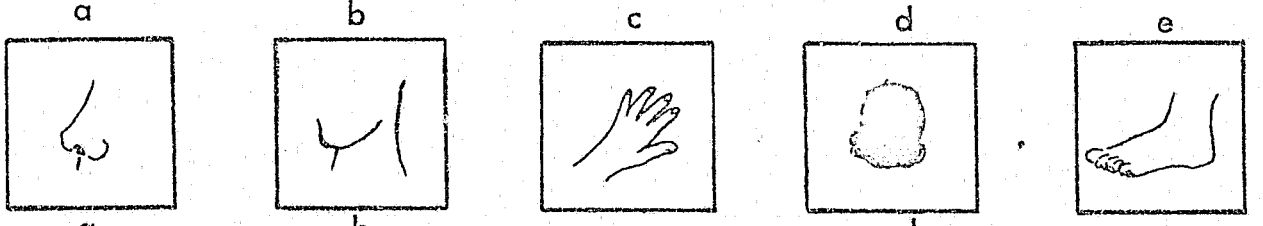

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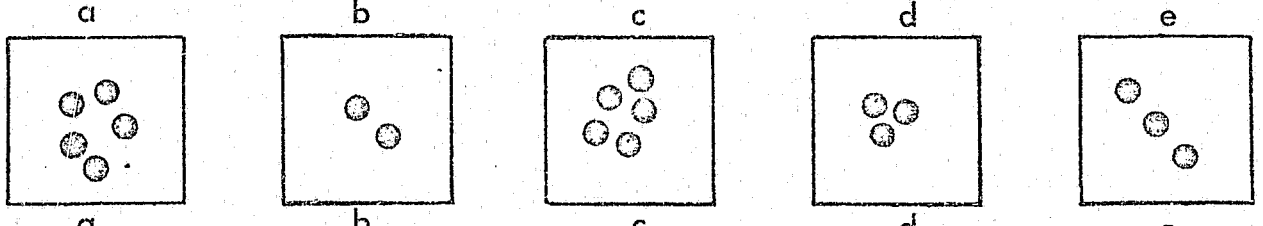

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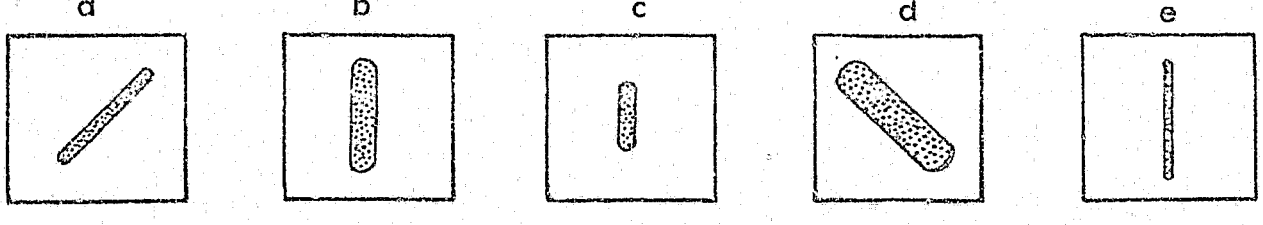

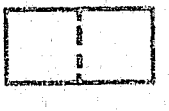

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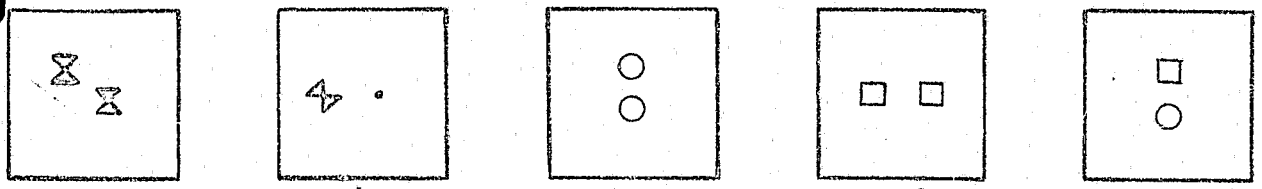

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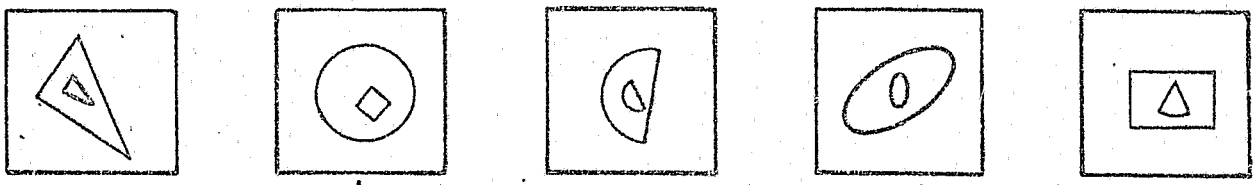

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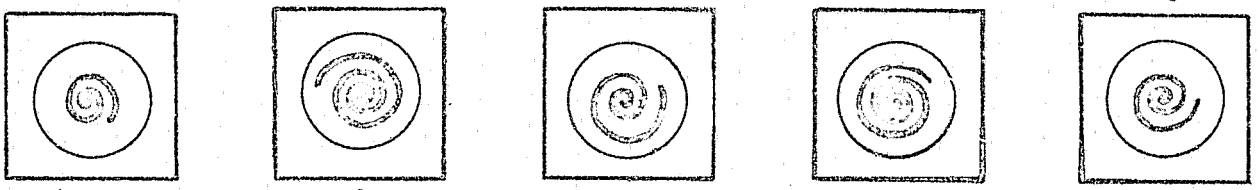

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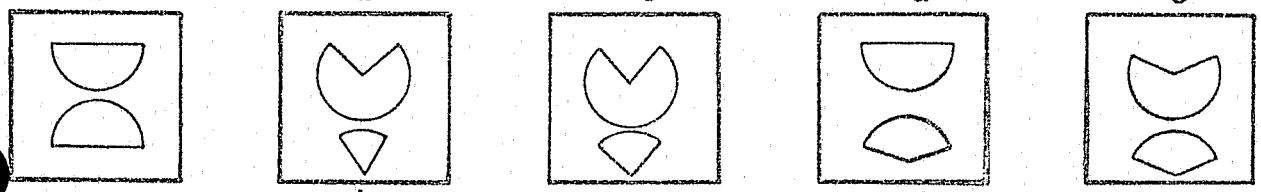

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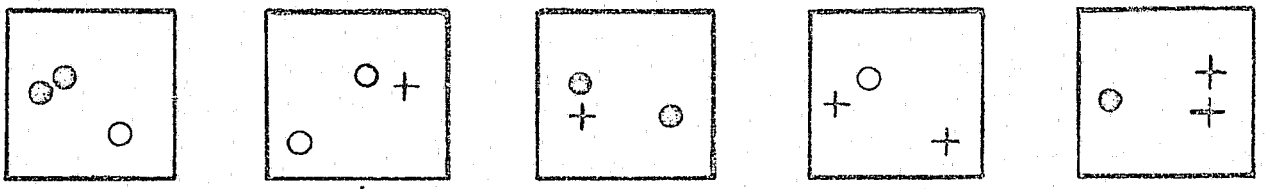

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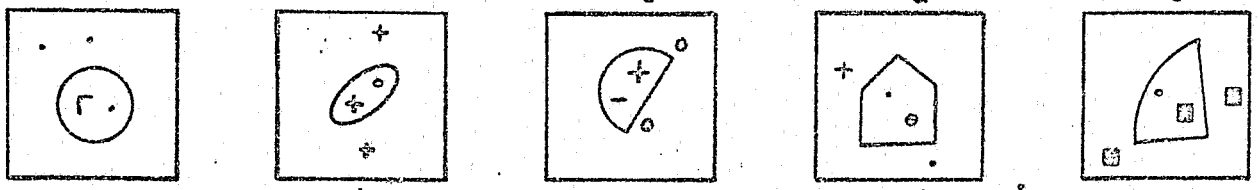

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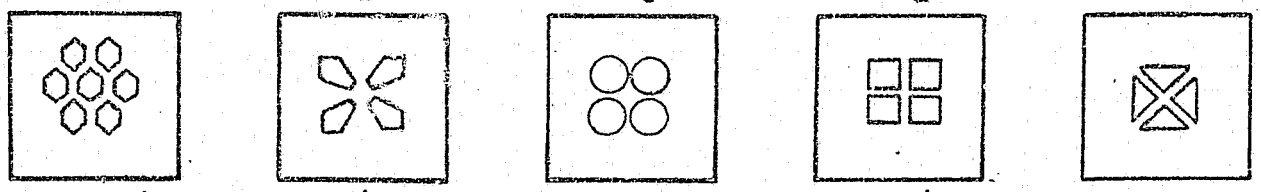

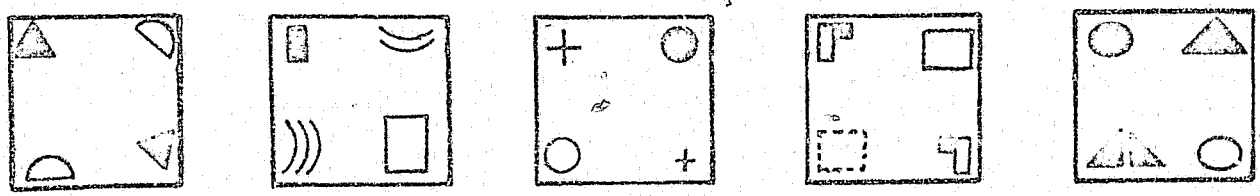

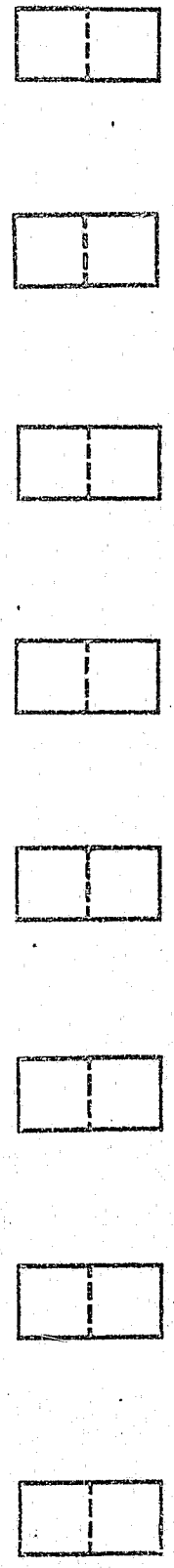

End of Test 2

STOP! Do not turn the page until told to do so.

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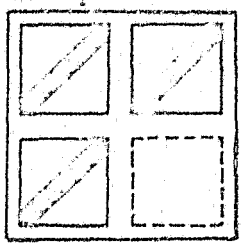

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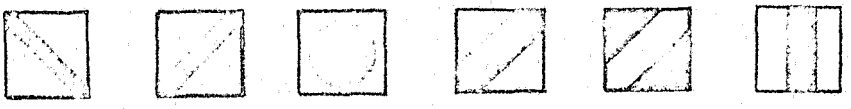
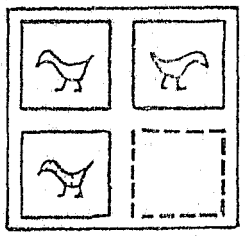


Answers

b



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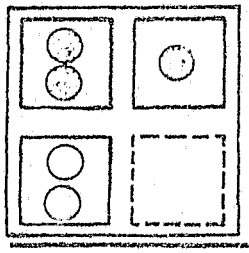

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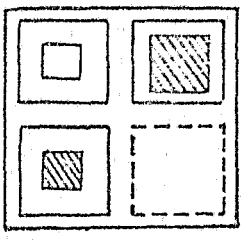

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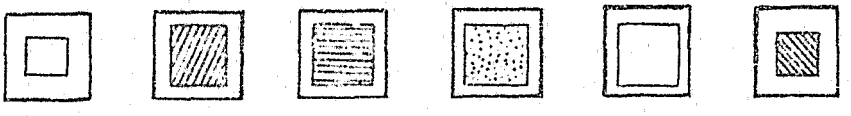

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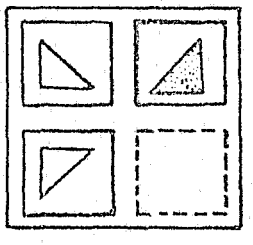

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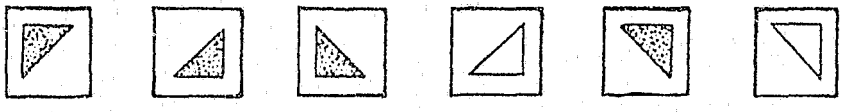

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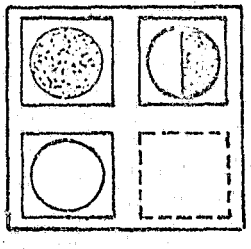

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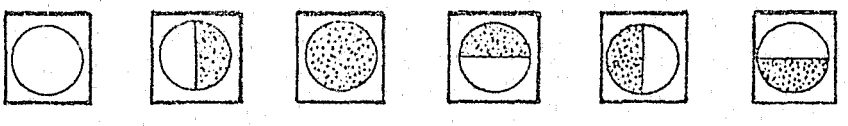

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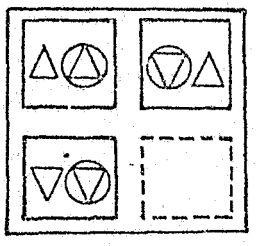

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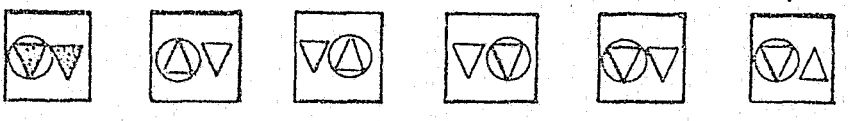

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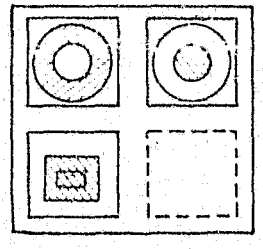
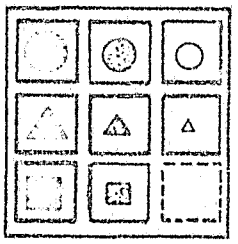
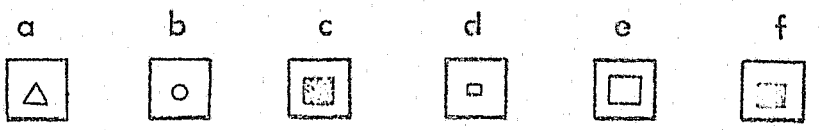
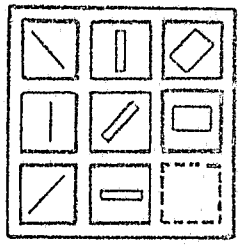
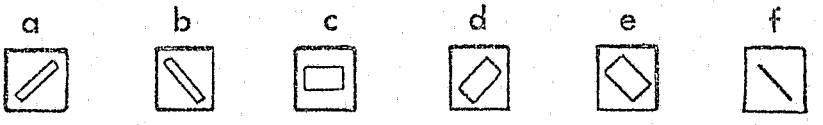
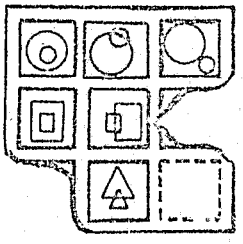
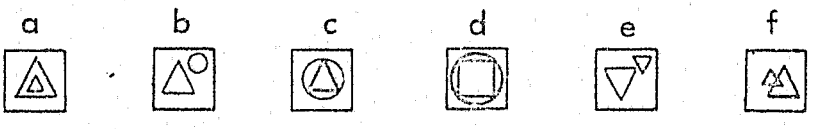


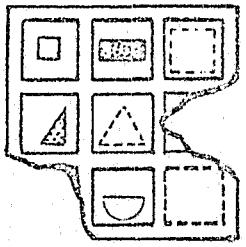
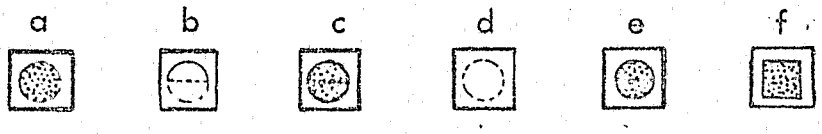
6.

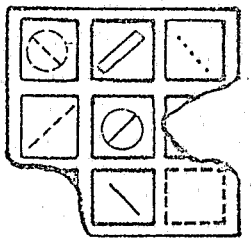
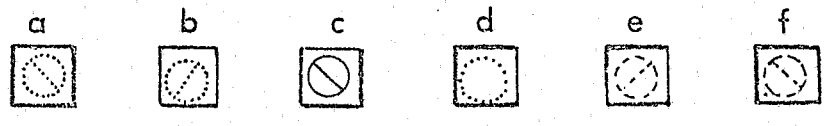
Go on to the next page

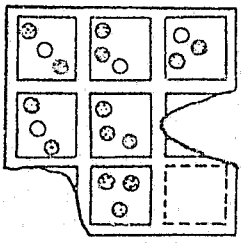
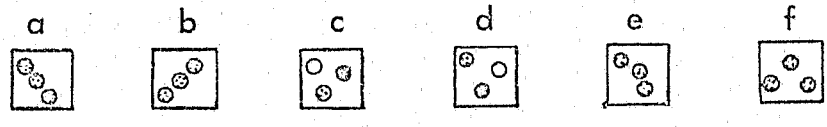
6. 


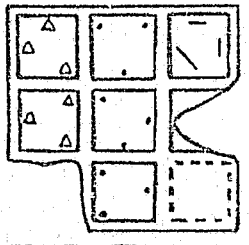
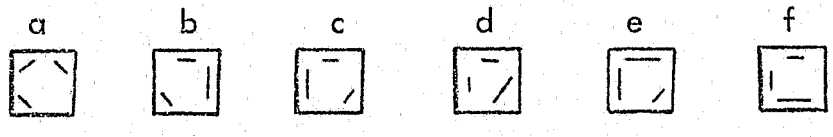
7. 


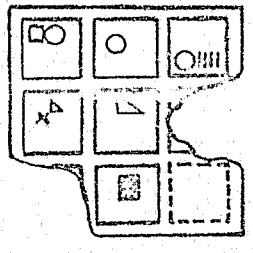
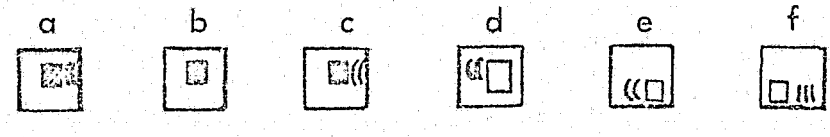
8. 


9. 


10. 


11. 


12. 


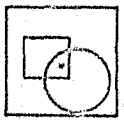
13. 


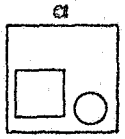
7.

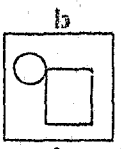
End of Test 3

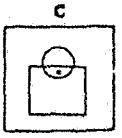
STOP! Do not turn the page until told to do so.

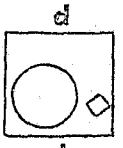
Examples

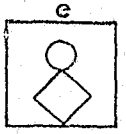


a 

b 

c 

d 

e 

Answers

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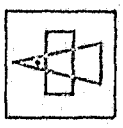
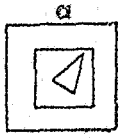
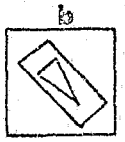
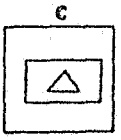
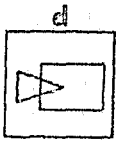
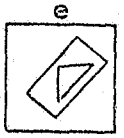


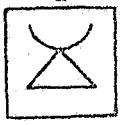
a 

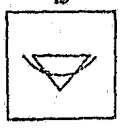
b 

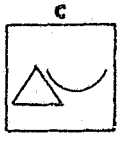
c 

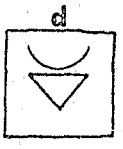
d 

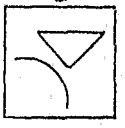
e 

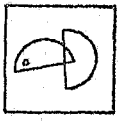
a 

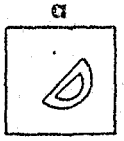
b 

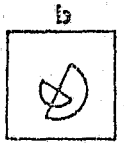
c 

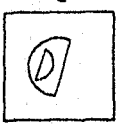
d 

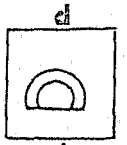
e 

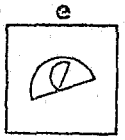
1. 

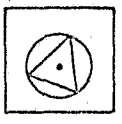
a 

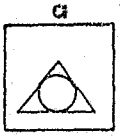
b 

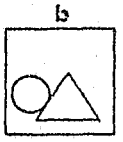
c 

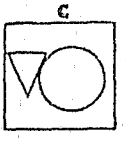
d 

e 

2. 

a 

b 

c 

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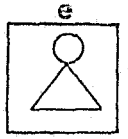
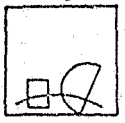
e 

3. 

a 

b 

c 

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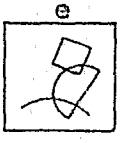
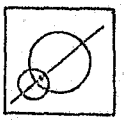
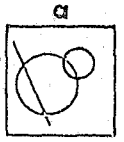
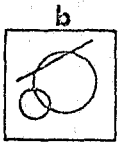
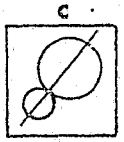
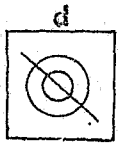
e 

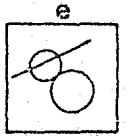
4. 

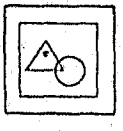
a 

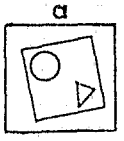
b 

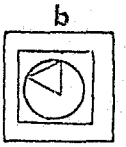
c 

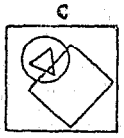
d 

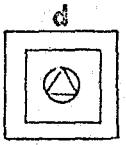
e 

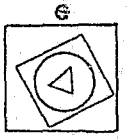
5. 

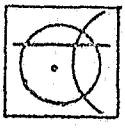
a 

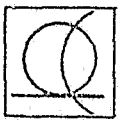
b 

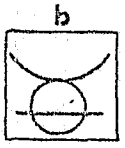
c 

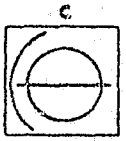
d 

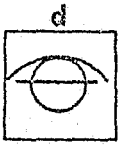
e 

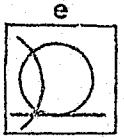
6. 

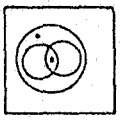
a 

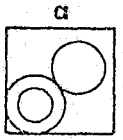
b 

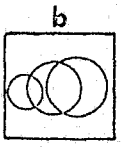
c 

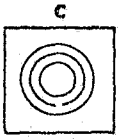
d 

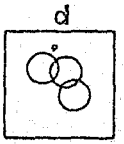
e 

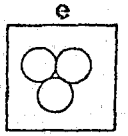
7. 

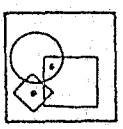
a 

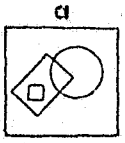
b 

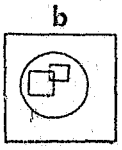
c 

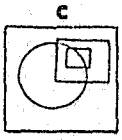
d 

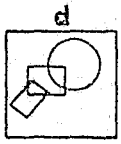
e 

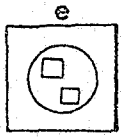
8. 

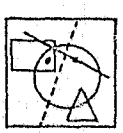
a 

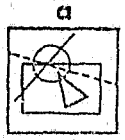
b 

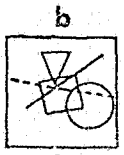
c 

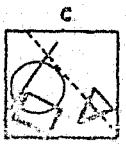
d 

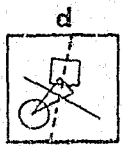
e 

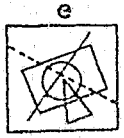
9. 

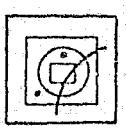
a 

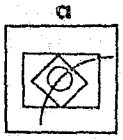
b 

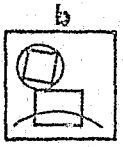
c 

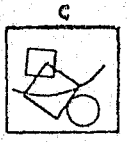
d 

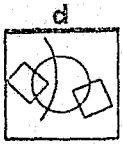
e 

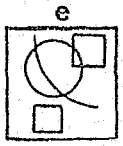
10. 

a 

b 

c 

d 

e 

End of Test 4

2.4 Dermatoglyphics Forms

CONTINUED

1 OF 4

DATA COLLECTION FORMS DESIGNED BY THE DERMATOGLYPHICS LABORATORY

1. Palmar Data Forms (#s DC-2-1 and DC-3-1) for Right and Left Hands.

These forms are used to record data taken from palm prints. Only data which are actually present are coded. When a pattern or triradius is present, it is noted by recording the number of angular degrees in the C.V. point system and the millimetric distance from the C.V. point to the triradius in the appropriate columns.

The form lists the most common possible ridge-counts; when a count is present on a hand, the number of ridges between the two count points is entered. When a count cannot be made a line is drawn through the corresponding boxes if the count cannot be made on a clear print. When a count cannot be made because the ridges are parallel, then 0-0 is recorded. When a count cannot be made because the print is incomplete or smudged, then 9-9 is recorded.

2. Palmar Exception Forms (#s DC-4-1 and DC-5-1) for Right and Left Hands.

These forms are used to record data taken from palmprints that do not fall into one of the categories listed on the regular Palmar Data Forms above. The exception form is needed for less than 5% of the cases studied. Triradii which do not occur on the main form are e^1, e^2, f, and all of the Z-triradii. Patterns which are not on the main form are a third pattern in the hypothenar pattern, a second pattern in any area, and other unusual patterns.

The name of the triradius is listed on the appropriate line. The code is taken from a list of all conceivable exceptional triradii, patterns, or ridge-counts. For patterns, the Type section on both the Main Form and the Exception Form codes the orientation of the pattern -- i.e., one code means that the pattern faces towards the center of the palm, another means that it faces away from the center of the palm, etc.

3. Fingerprint Coding Form (JW-1-1)

This form is used to record data taken from fingerprints. The radial and ulnar ridge-counts are recorded and a code for the pattern type of each digit is recorded.

The pattern code is a two-digit code. The first digit specifies the orientation of the pattern, whether ulnar, symmetric, or radial; the second digit specifies the pattern type as determined by the number of triradii for all patterns except whorls which are sub-classified by the inter-relationships of the cores.

The ridge-counts are recorded for both sides of a digit -- both the radial count and ulnar count are recorded. For plain arches and symmetric loops (tented arches) both counts are zero. For ulnar loops the

ulnar count is zero; for radial loops the radial count is zero. For whorls, neither count can be zero. Ridge-counts are made from the triradius to the core, with the core counting as one ridge-count. In the case of double-loop whorls, the count is made from each triradius to the core which is in closest morphological relationship to it.

4. Summary Report Forms.

These two forms summarize data from the previous forms to comprise a physician's report.

RIGHT HAND PALMAR DATA

Name

Date

Subject I.D.

Status Code

Add'l. Form?

TRIRADII

0 2 2 | 0 0 0

	# deg	mm
a		
b		
c		
a'		
b'		
c'		
d'		
a'b'		
b'c'		
c'd'		
r		
r'		

0 2 3 | 0 0 0

	# deg	mm
t'		
t''		
t'''		

PATTERNS

	type
I	
II	
III	
IV	
H1	
H2	

RIDGE COUNTS 1

0 2 4 | 0 0 0

a-b	
a-a'	
a-a'b'	
a-II	
a'-II	
a'b'-II	
b-a'	
b-a'b'	
b-c	
b-b'c'	
b-II	
b-III	
b'-II	
b'-III	
b'c'-III	
c-b'	
c-b'c'	
c-d	
c-c'd'	
ATD$_L$	
Year of Birth	

RIDGE COUNTS 2

0 2 5 | 0 0 0

c-III	
c-IV	
c'-III	
c'-IV	
c'd'-IV	
d-c'	
d-c'd'	
d-d'	
d-IV	
d'-IV	
t-H1	
t-H2	
t-I	
t'-H1	
t'-H2	
t''-H1	
t''-H2	
r-H1	
r-H2	

Coder | Sex | Race

LEFT HAND PALMAR DATA

Name

Date

Subject I.D. | Status Code

Add'l. Form?

TRIRADII

0 2 7 | 0 0 0

	#	deg	mm
a			
b			
c			
a'			
b'			
c'			
d'			
a'b'			
b'c'			
c'd'			
r			
r'			

PATTERNS

0 2 8 | 0 0 0

	type	#	deg	mm
t				
t'				
t''				
I				
II				
III				
IV				
H1				
H2				

RIDGE COUNTS 1

0 2 9 | 0 0 0

a-b	
a-a'	
a-a'b'	
a-II	
a'-II	
a'b'-II	
b-a'	
b-a'b'	
b-c	
b-b'c'	
b-II	
b-III	
b'-II	
b'-III	
b'c'-III	
c-b'	
c-b'c'	
c-d	
c-c'd'	
ATD$_L$	
Year of Birth	

RIDGE COUNTS 2

0 3 0 | 0 0 0

c-III	
c-IV	
c'-III	
c'-IV	
c'd'-IV	
d-c'	
d-c'd'	
d-d'	
d-IV	
d'-IV	
t-H1	
t-H2	
t-I	
t'-H1	
t'-H2	
t"-H1	
t"-H2	
r-H1	
r-H2	

Coder | Sex | Race

RIGHT HAND PALMAR EXCEPTION FORM

Name _____ Date _____ Add'l Form? _____

Subject ID						Card Type			Seq #			Change
						0	2	6	0	0		
1	2	3	4	5	6	7	8	9	10	11	12	15

TRIRADII

NAME

	Code	# deg.	mm.
_____	16 17	18 19 20	21 22
_____	23 24	25 26 27	28 29
_____	30 31	32 33 34	35 36

PATTERNS

NAME

	Code	Type	#Deg.	mm.
_____	37 38	39 40	41 42 43	44 45
_____	46 47	48 49	50 51 52	53 54
_____	55 56	57 58	59 60 61	62 63

RIDGE COUNTS

NAME

	Code	Count
_____	64 65	66 67
_____	68 69	70 71
_____	72 73	74 75

DP-4-3

76	77	78
Coder		

LEFT HAND PALMAR EXCEPTION FORM

Name _____ Date _____ Add'l Form? _____

Subject ID						Card Type			Seq #			Status
						0	3	1	0	0		
1	2	3	4	5	6	7	8	9	10	11	12	15

TRIRADII

NAME	Code	# deg.	mm.
_____	16 17	18 19 20	21 22
_____	23 24	25 26 27	28 29
_____	30 31	32 33 34	35 36

PATTERNS

NAME	Code	Type	#Deg.	mm.
_____	37 38	39 40	41 42 43	44 45
_____	46 47	48 49	50 51 52	53 54
_____	55 56	57 58	59 60 61	62 63

RIDGE COUNTS

NAME	Code	Count
_____	64 65	66 67
_____	68 69	70 71
_____	72 73	74 75

DC-5-1

76	77	78
Coder	Sex	Race

FINGERPRINT CODING FORM

Name _____ Date _____

id.						Source	Card Type			Sequence			Status Code
							0	2	1	0	0		
1	2	3	4	5	6		7	8	9	10	11	12	15

	radial		ulnar		pattern	
I		16 17		18 19		20 21
II		22 23		24 25		26 27
III		28 29		30 31		32 33
IV		34 35		36 37		38 39
V		40 41		42 43		44 45

I		46 47		48 49		50 51
II		52 53		54 55		56 57
III		58 59		60 61		62 63
IV		64 65		66 67		68 69
V		70 71		72 73		74 75

JW-1-1

76	77	78
Coder	Sex	Race

DERMATOGLYPHIC REPORT

name: number:

date: classifier:

diagnosis: referral:

Pattern Frequency on digits:

Digits	finger ridge count	arches	whorls	ulnar loops	radial loops	
r.h.						
l.h.						
sums						

Palmar	a - b ridge count	a t d angle	Patterns in palmar area: I	II	III	IV	H
r.h.							
l.h.							
sums							

Comment:

See over leaf for normal data.

NORMAL VALUES AND FREQUENCIES

FINGERS

		Ridge Ct.	% Arches	% Whorls	% Ulnar Loops	% Radial Loops	
Males	r.h.	69.65	3.68	31.96	57.88	6.28	
	σ						
	l.h.	72.67	4.71	24.68	65.12	5.52	
	σ						
	Sums	145.18	4.28	28.32	61.50	5.90	
	σ	50.49					
Females	r.h.	59.26	4.88	25.32	66.00	3.8	
	σ						
	l.h.	63.87	6.48	22.52	65.16	5.84	
	σ						
	Sums	126.97	5.68	23.92	65.58	4.82	
	σ	52.33					

PALMAR

		a – b Ridge Count	angle	% I	% II	% III	% IV	% H
Males	r.h.	41.44	42.75	3.9	4.8	51.8	44.3	32.2
	σ	5.5						
	l.h.	40.98	43.95	11.1	3.2	32.9	59.5	30.3
	σ	5.4						
	Sums	83.04	85.0	7.5	4.1	42.4	52.0	31.3
	σ	10.28	15.3					
Females	r.h.	41.93	42.76	5.0	2.5	50.5	44.4	39.5
	σ	5.4						
	l.h.	42.03	43.75	8.1	1.6	28.6	56.0	35.8
	σ	4.9						
	Sums	83.01	85.9	6.6	2.0	39.7	50.2	37.7
	σ	9.72	15.7					

SCREENING CLINIC PATENT SUMMARY REPORT

Patient's Name: _____ Number: _____ Sex: ____ Race: _____ Date __/__/__ Source ___ ___

HANDS

Finger patterns	I	II	III	IV	V
Right hand					
Left hand					

Total finger ridge-count

Right hand only _____

Left hand only _____

Both hands _____

Palm patterns

Right palm (list) _____

Left palm (list) _____

Miscellaneous	R	L	Σ
a-b ridge count			
a-d distance (mm)			
a-CV-t angle			

FEET

Toe patterns	I	II	III	IV	V
Right foot					
Left foot					

Total toe ridge-count

Right foot only _____

Left foot only _____

Both feet _____

Sole patterns

Right foot (list) _____

Left foot (list) _____

Miscellaneous	R	L	Σ
a-b ridge count			
a-d distance (mm)			
a-CV-t angle			

[a-CV-t agle; 180° = normal
<180° = ulnar deviation
> 180° = radial deviation]

Initial _____

τjεθ

2.5 Cytogenetic Analysis Form

A

B

C

D

E

F

G

CYBERLAB*
MEDICAL QUESTIONNAIRE

DIRECTIONS:

This questionnaire is made up of a number of questions, all of which can be answered by the words YES or NO. Skip any question that you are unable to answer. In particular if you are a man skip any question marked *FEMALE.*

A sample question is:

HAVE YOU EVER HAD A NOSEBLEED? YES____ 000 NO____

If you wish to answer YES, make a check mark after the word YES, as shown. YES_✓_ 000 NO____

If you wish to answer NO, make a check mark after the word NO, as shown. YES____ 000 NO_✓_

Try to answer all questions as correctly as possible, even if they seem unimportant to you.

The information derived from this questionnaire will be held in strict confidence.

Name _____

Address _____

_____ _____
Zip Code

Do you have a problem you would like to discuss with a doctor?	YES____ 001	NO____
Does anyone in your family have sugar diabetes?	YES____ 002	NO____
Does the room ever spin around or do things get blurred?	YES____ 026	NO____
Do your hands shake constantly?	YES____ 004	NO____
Is your walking unsteady?	YES____ 005	NO____
Do you sometimes hear a ringing or buzzing sound in your ear?	YES____ 027	NO____
Do you sometimes vomit blood?	YES____ 007	NO____
Do you sometimes have severe pains in your stomach that double you up?	YES____ 008	NO____
Have you recently noted any blood in your bowel movements?	YES____ 009	NO____
Have you recently noticed a decrease in your appetite?	YES____ 010	NO____
Are you bronchial?	YES____ 011	NO____
Do your legs ever swell up?	YES____ 012	NO____
Do you have to stop and rest two or three times when you walk up stairs or up a hill?	YES____ 013	NO____
Do you wish to see a dentist?	YES____ 075	NO____
Do you ever have double vision?	YES____ 015	NO____
Were you ever told you had a stomach ulcer?	YES____ 016	NO____
Do you drink alcohol?	YES____ 017	NO____
Have you ever been told you have gallstones?	YES____ 018	NO____
Does anyone in your family have serious kidney trouble?	YES____ 019	NO____
Were you ever told you had kidney trouble?	YES____ 020	NO____
When you were a child, did you suffer with joint pains or growing pains?	YES____ 021	NO____
Has your urinary stream recently gotten weak?	YES____ 076	NO____
Were you ever told you had a heart murmur?	YES____ 023	NO____
Have you ever had a shock (stroke)?	YES____ 024	NO____
Do you sometimes feel dizzy and lose your balance?	YES____ 025	NO____
Do you recently find that you are urinating (passing water) very frequently?	YES____ 077	NO____
FEMALE: Have any of your babies weighed 9 pounds or more at birth?	YES____ 003	NO____
FEMALE: Do you sometimes have bleeding when it is not your period?	YES____ 006	NO____
FEMALE: If your periods have stopped completely, do you ever notice any bleeding or spotting?	YES____ 028	NO____

PLEASE CONTINUE ON THE NEXT PAGE

QUESTIONNAIRE
HEET

		YES____ 001 NO____
Do you sometimes have pains which go from your back into your legs when you cough or sneeze or carry something heavy?	YES____ 030 NO____	YES____ 002 NO____
Has your voice gotten hoarse recently?	YES____ 031 NO____	YES____ 026 NO____
Do you get pain in any of your joints?	YES____ 032 NO____	YES____ 004 NO____
Do you have rheumatism or arthritis?	YES____ 033 NO____	YES____ 005 NO____
Do you have any lumps or unusual swellings that have recently appeared?	YES____ 034 NO____	YES____ 027 NO____
		YES____ 007 NO____
Have you ever passed blood in your urine and not seen a doctor about it?	YES____ 035 NO____	YES____ 008 NO____
Do you ever have attacks of shortness of breath?	YES____ 036 NO____	YES____ 009 NO____
Are you troubled with frequent or persistent coughing?	YES____ 037 NO____	YES____ 010 NO____
Do you have to use extra pillows to sleep comfortably?	YES____ 038 NO____	YES____ 011 NO____
Do you get short of breath when walking with other people your own age at ordinary pace on level ground?	YES____ 039 NO____	YES____ 012 NO____
		YES____ 013 NO____
Do you sometimes get pains or cramps in the back of your legs when you walk?	YES____ 040 NO____	YES____ 075 NO____
Do you sometimes have blackouts, dizzy spells or fainting?	YES____ 041 NO____	YES____ 015 NO____
Do you have a cough productive of phlegm for as much as two months out of the year?	YES____ 078 NO____	YES____ 016 NO____
		YES____ 017 NO____
Have you recently had difficulty in starting to urinate (pass water)?	YES____ 082 NO____	YES____ 018 NO____
Do you get breathless when walking up a slight hill or a flight of stairs?	YES____ 044 NO____	YES____ 019 NO____
		YES____ 020 NO____
Have you lost weight in the past six months?	YES____ 045 NO____	YES____ 021 NO____
Have you recently had pain or aching in your stomach?	YES____ 046 NO____	YES____ 076 NO____
Do you have some teeth which are bad?	YES____ 079 NO____	YES____ 023 NO____
Are you troubled with frequent loose bowel movements?	YES____ 048 NO____	YES____ 024 NO____
Do you have a hernia (rupture)?	YES____ 049 NO____	YES____ 025 NO____
Have you recently had a black bowel movement?	YES____ 050 NO____	YES____ 077 NO____
Do you have an aunt or uncle with sugar diabetes?	YES____ 051 NO____	YES____ 003 NO____
Have you lost your desire for food?	YES____ 052 NO____	YES____ 006 NO____
Do you ever cough blood?	YES____ 053 NO____	
FEMALE: Have you a lump on your breast?	YES____ 029 NO____	YES____ 028 NO____

PLEASE CONTINUE OVER LEAF

L1, MHQ02, _____
EXAM NUMBER

Do you have a mole that has recently changed in size or color? YES___ 030 NO___

Do you smoke cigarettes? YES___ 055 NO___

Do you frequently experience a lot of gas and discomfort after eating fried or fatty foods? YES___ 081 NO___

Has anyone in your family died young because of kidney trouble? YES___ 057 NO___

Were you ever told you had Bright's Disease? YES___ 058 NO___

Were you ever told you had nephritis? YES___ 059 NO___

Were you ever told you had rheumatic fever? YES___ 060 NO___

Do you ever have trouble keeping your balance? YES___ 061 NO___

Do your joints ever swell up? YES___ 063 NO___

Are your joints stiff in the morning? YES___ 064 NO___

Do you ever have wheezing? YES___ 065 NO___

Do you ever get a pain or feeling of pressure in your chest which comes on while you are active or when you get excited? YES___ 066 NO___

Do you ever get a pain or feeling of pressure in your chest which comes on while you are resting? YES___ 067 NO___

Have you lost more than five pounds in the last six months? YES___ 068 NO___

Are you dieting? YES___ 069 NO___

Have you recently had pain or aching in your stomach which is relieved by eating or drinking? YES___ 070 NO___

Have you had pain or aching in your stomach which often awakens you at night? YES___ 071 NO___

Have you recently had a bowel movement that looked like tar? YES___ 072 NO___

Do you frequently have bronchitis? YES___ 073 NO___

Does any member of your family have gout? YES___ 074 NO___

Did you miss a lot of school because of illness as a child? YES___ 022 NO___

Do you sometimes feel palpitations or fluttering in your chest? YES___ 043 NO___

FEMALE: Do you sometimes have bleeding or spotting between your periods? YES___ 062 NO___

END OF QUESTIONNAIRE

CYBERLAB MEDICAL QUESTIONNAIRE
ANSWER SHEET

L1, MHQ02,_____
EXAM NUMBER

YES____ 080 NO____

YES____ 055 NO____

YES____ 081 NO____

YES____ 057 NO____

YES____ 058 NO____

YES____ 059 NO____

YES____ 060 NO____

YES____ 061 NO____

YES____ 063 NO____

YES____ 064 NO____

YES____ 065 NO____

YES____ 066 NO____

YES____ 067 NO____

YES____ 068 NO____

YES____ 069 NO____

YES____ 070 NO____

YES____ 071 NO____

YES____ 072 NO____

YES____ 073 NO____

YES____ 074 NO____

YES____ 022 NO____

YES____ 043 NO____

YES____ 062 NO____

YES____ 030 NO____

YES____ 031 NO____

YES____ 032 NO____

YES____ 033 NO____

YES____ 034 NO____

YES____ 035 NO____

YES____ 036 NO____

YES____ 037 NO____

YES____ 038 NO____

YES____ 039 NO____

YES____ 040 NO____

YES____ 041 NO____

YES____ 078 NO____

YES____ 082 NO____

YES____ 044 NO____

YES____ 045 NO____

YES____ 046 NO____

YES____ 079 NO____

YES____ 048 NO____

YES____ 049 NO____

YES____ 050 NO____

YES____ 051 NO____

YES____ 052 NO____

YES____ 053 NO____

YES____ 029 NO____

YES____ 001 NO____

YES____ 002 NO____

YES____ 026 NO____

YES____ 004 NO____

YES____ 005 NO____

YES____ 027 NO____

YES____ 007 NO____

YES____ 008 NO____

YES____ 009 NO____

YES____ 010 NO____

YES____ 011 NO____

YES____ 012 NO____

YES____ 013 NO____

YES____ 075 NO____

YES____ 015 NO____

YES____ 016 NO____

YES____ 017 NO____

YES____ 018 NO____

YES____ 019 NO____

YES____ 020 NO____

YES____ 021 NO____

YES____ 076 NO____

YES____ 023 NO____

YES____ 024 NO____

YES____ 025 NO____

YES____ 077 NO____

YES____ 003 NO____

YES____ 006 NO____

YES____ 028 NO____

Figure 5

CYBERLAB

PHYSIOLOGICAL TEST RESULTS

L1, PTR01, _____ EXAM NUMBER

L2, Sex (M/F) ☐ Age (yr.) ☐☐☐ Date M M D D Y Y ☐☐☐☐☐☐

VISION

L3, FAR: Corr. Lens.? ☐ Acuity Both ☐☐ Right ☐☐ Occ? ☐ Left ☐☐ Occ? ☐

L4, Stereo ☐ Color ☐ V. Phoria ☐ L. Phoria ☐☐

L5, NEAR: Corr. Lens.? ☐ Acuity Both ☐☐ Right ☐☐ Occ? ☐ Left ☐☐ Occ? ☐

L6, L. Phoria ☐☐

SPIROMETRY

L7 ck. one ☐ 1 ☐ 2 ☐ 3 Peak ☐☐☐ FEV1 ☐☐☐ FEV3 ☐☐☐ Vit. Cap. ☐☐☐

AUDIOMETRY

	500	1K	2K	3K	4K	6K
L8, LEFT	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐
L9, RIGHT	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐

GENERAL

L10, Temp. ☐☐☐△☐

L11, Weight ☐☐☐ Height ☐☐△☐ Skinfold-arm ☐☐ -scapula ☐☐

L12, Chest ☐☐△☐ Waist ☐☐△☐ R. Calf ☐☐△☐ L. Calf ☐☐△☐

L13, Pulse ☐☐☐

BLOOD PRESSURE

L14, Rt. Supine ☐☐☐/☐☐☐ Lt. Supine ☐☐☐/☐☐☐ Lt. Sitting ☐☐☐/☐☐☐

TONOMETRY

L15, Right (O.D.) ☐☐ Left (O.S.) ☐☐

COMMENTS:

Examiner Initials _____

form PTR01 CYBERLAB, a division of CYBER, INC., 276 Third St., Cambridge, Mass. 02142 (617) 491-5630

Figure 6

CYBERLAB URINALYSIS FORM

L1, URNO1, _____ EXAM NUMBER

URINALYSIS L2,

Color	[1] yellow	[2] orange	[3] red		
Appearance	[1] clear	[2] cloudy			
pH (Reaction)	[ ][ ][ ],	Specific Gravity 1.0 [ ][ ]			
Glucose (Sugar)	[1] neg.	[2] 1+	[3] 2+	[4] 3+	[5] 4+
Protein (Albumin)	[1] neg.	[2] pos.	[3] trace		
Bile (Bilirubin)	[1] neg.	[2] pos.			
Ketone (Acetone)	[1] neg.	[2] pos.			
Occult Blood	[1] neg.	[2] pos.	[3] trace		

Microscopic L3,

RBC	[1] <10	[2] ⩾10	[3] TNTC		
WBC	[1] <10	[2] ⩾10	[3] TNTC		
Casts:					
Granular	[1] none	[2] few	[3] many		
RBC	[1] none	[2] few	[3] many		
WBC	[1] none	[2] few	[3] many		
Hyaline	[1] none	[2] few	[3] many ,		
Crystals:					
Phosphate	[1] none	[2] few	[3] many		
Oxalate	[1] none	[2] few	[3] many		
Uric Acid	[1] none	[2] few	[3] many		
Cystine	[1] none	[2] few	[3] many		
Bacteria	[1] neg.	[2] few	[3] pos.		

Date _____ MM/DD/YY

Tech Init. _____

form URNO1 CYBERLAB, a division of CYBER, INC., 276 Third St., Cambridge, Mass. 02142 (617) 491-5630

CYBERLAB BLOOD CHEMISTRY BATCH FORM (SMA-12)

S1202

	EXAM NO.	CA++	PHOS	GLU	BUN	URIC ACID	CHOL	T.P.	ALB	TOTAL BILI	ALK PHOS	LDH	SGOT
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													

12/23/70

DATE:

MM/DD/YY

BATCHED BY:

KEYPUNCHED BY:

VERIFIED BY:

Figure 7

CYBERLAB HEMATOLOGY BATCH FORM (SMA-7)

S0702

	EXAM NO.		WBC	HCT	HGB	RBC	MCV	MCH	MCHC
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

DATE: _____
MM/DD/YY

BATCHED BY: _____

KEYPUNCHED BY: _____

VERIFIED BY: _____

2/18/70

Figure 8

Figure 9

EXAMPLE OF CYBER LAB OUTPUT

CYBER INC. 276 THIRD STREET CAMBRIDGE MASSACHUSETTS 02142 TELEPHONE (617) 491-5630

December 24, 1970

Michael K. Rees, M.D.
Peter Bent Brigham Hospital
721 Huntington Avenue
Roxbury, Massachusetts 02115

Dear Doctor Rees:

I am attaching the results of CYBERLAB Examination No. 111111 performed on December 22, 1970 .

Patient Name:

Address:

Telephone:

Social Security No.:

Date of Birth:

Sex:

Sincerely yours,

Frank R. Ervin, M.D.
Medical Director

EXAM NO.: 111111
DATE: 12/22/70

MEDICAL HISTORY (POSITIVE RESPONSES)

PATIENT STATES THAT:

SHE SMOKES CIGARETTES. SHE DRINKS ALCOHOL. SHE HAS SOME TEETH WHICH ARE BAD.

SHE IS TROUBLED WITH FREQUENT OR PERSISTENT COUGHING. SHE HAS HAD ATTACKS OF SHORTNESS OF BREATH. SHE GETS SHORT OF BREATH WHEN WALKING WITH OTHER PEOPLE HER OWN AGE AT ORDINARY PACE ON LEVEL GROUND.

SHE SUFFERED WITH JOINT PAINS OR GROWING PAINS AS A CHILD. SHE HAS BEEN TOLD SHE HAD A HEART MURMUR. SHE HAS BEEN TOLD SHE HAD RHEUMATIC FEVER. SHE HAS HAD A PAIN OR FEELING OF PRESSURE IN HER CHEST WHICH COMES ON WHILE SHE IS ACTIVE OR WHEN SHE GETS EXCITED.

SHE RECENTLY FINDS THAT SHE IS URINATING VERY FREQUENTLY.

HER JOINTS HAVE SWOLLEN UP.

SHE HAS FELT DIZZY AND LOST HER BALANCE.

PHYSIOLOGICAL TEST RESULTS

GENERAL

SEX:	FEMALE	
AGE:	25 YRS.	
HEIGHT:	63.5 IN.	
WEIGHT:	162 LBS.	<---
CHEST:	38.0 IN.	
WAIST:	32.5 IN.	
RIGHT CALF:	15.5 IN.	
LEFT CALF:	15.5 IN.	
SKINFOLD (TRICEPS):	35 MM.	<---
SKINFOLD (SCAPULA):	27 MM.	

VITAL SIGNS

TEMPERATURE:		98.6 DEG.	
PULSE:		88/MIN.	
BLOOD PRESSURE:	RIGHT-SUPINE:	120/60	<---
	LEFT-SUPINE:	120/60	<---
	LEFT-SITTING:	120/80	

VISION

FAR VISUAL ACUITY :	BIN.:	20/20	(NO CORR. LENSES)
	O.D.:	20/22	(O.S. OCC.)
	O.S.:	20/20	
NEAR VISUAL ACUITY :	BIN.:	20/22	(CORR. LENSES)
	O.D.:	20/30	(O.S. OCC.)
	O.S.:	20/22	(O.D. OCC.)

VERTICAL PHORIA FAR: .5 P.D. LEFT HYPERPHORIA

LATERAL PHORIA FAR: 1.0 P.D. EXOPHORIA

LATERAL PHORIA NEAR: 1.5 P.D. EXOPHORIA

COLOR: 8/8 CORRECT

STEREOPSIS: 40 SEC. OF ARC

TONOMETRY

INTRA-OCULAR PRESSURE: O.D.: 24 MM. HG

O.S.: 24 MM. HG

AUDIOMETRY

HEARING LOSS (DB.)

FREQUENCY (HZ)	500	1000	2000	3000	4000	6000	
A.S. :	10	5	10	15	20	35	<---
A.D. :	15	10	10	10	20	30	

PULMONARY FUNCTION

FEV - 1 SEC.:	2300 ML.	
FEV - 3 SEC.:	2500 ML.	
FORCED VITAL CAPACITY:	2500 ML.	<---
PREDICTED VITAL CAPACITY:	3455 ML..	
FEV1/FVC:	92.0 %	
FEV1/PVC:	66.6 %	<---
PEAK FLOW RATE:	295 L/MIN.	

ELECTROCARDIOGRAPHY

BLOOD PRESSURE (RIGHT SUPINE) = 120/60
PULSE = 68/MIN.
RATE = 95/MIN.
AXIS = +75 DEGREES

INTERVALS:

PR = .16 SEC.
QRS = .08 SEC.
QT = .40 SEC. QTC = .50 SEC. <---

RHYTHM ANALYSIS:

SINUS MECHANISM WITH ATRIAL PREMATURE CONTRACTIONS

QRS, ST AND T WAVE MORPHOLOGIES:

LEADS I, II, III: NORMAL

LEADS AVR, AVL, AVF: NORMAL

PRECORDIAL LEADS, ANTERIOR SEPTAL POSITION: NORMAL; FLAT T

PRECORDIAL LEADS, ANTERIOR LATERAL POSITION: DEEP S; U WAVE PRESENT

CHEMISTRY LABORATORY RESULTS

URINALYSIS

COLOR	YELLOW
APPEARANCE	CLEAR
PH(REACTION)	8.5
SP. GRAVITY	1.027
GLUCOSE	NEGATIVE
ALBUMIN	TRACE
ACETONE	NEGATIVE
OCCULT BLOOD	NEGATIVE

MICROSCOPIC:

CELLS:

RBC	FEWER THAN 10
WBC	FEWER THAN 10

CASTS:

GRANULAR	NONE
RBC	NONE
WBC	NONE
HYALINE	NONE

CRYSTALS:

PHOSPHATE	NONE
OXALATE	NONE
URIC ACID	NONE
CYSTINE	NONE

BACTERIA: NEGATIVE

EXAM NO.: 111111
DATE: 12/22/70

BLOOD CHEMISTRY

			NORMALS	
CALCIUM:	8.8	MG%	8.5-10.5	
PHOSPHORUS:	4.4	MG%	2.5-4.5	
GLUCOSE:	75	MG%	65-110	
BUN:	9	MG%	10-20	
URIC ACID:	3.5	MG%	2.5-8.0	
CHOLESTEROL:	200	MG%	150-300	
TOTAL PROTEIN:	6.5	G%	6.0-8.0	
ALBUMIN:	3.7	G%	3.5-5.0	
TOTAL BILIRUBIN:	.3	MG%	.2-1.0	
ALKALINE PHOSPHATASE:	41	MU/ML	30-85	
LDH:	116	MU/ML	90-200	
SGOT:	18	MU/ML	10-50	

HEMATOLOGY

			NORMALS	
HEMOGLOBIN:	11.8	G%	11.5-16.0	
HEMATOCRIT:	36	%	37-47	<---
RBC COUNT:	3.4	MILLION/CU.MM	4.2-5.4	<---
M.C.V.:	108	CU. MICRONS	74-98	<---
M.C.H.:	34	MICROMCGM.	24-33	<---
M.C.H.C:	32	%	30-38	
WBC COUNT:	11800	/CU. MM.	5000-10000	<---

SEROLOGY

ART: NON-REACTIVE

I N D E X

BOOK THREE

C. PUBLICATIONS

B.1.2 Psychometric Validation Results

S U M M A R Y

Tables I - IV, listing problem areas elicited through the Problem Check List, show that this tool is highly discriminating among the four comparison groups. According to this data, violent individuals report a greater number of personal and sexual problems as well as more feelings of religious confusion and difficulties in social interaction.

Family violence, Table V, is more prevalent among the prison population and the control group versus the violent population. This preliminary result may remain constant or may prove to be a spurious finding caused by sample bias: relative to the prison population, the violent persons seen in the Screening Clinic are predominately of middle class backgrounds; relative to the control population, the violents are older and their recall of parental behavior may therefore be less accurate.

The FAV shows good discrimination among the four groups. The insignificant difference between the prison and violent populations agrees with previous work with prison populations (Climent et al[126]) which has suggested that this group provides a high yield sample of violent individuals.

The EPI depression score also agrees with the work of Climent et al, who found that a violent prison population was not significantly more depressed than a matched non-violent prison sample. The overt anger scale of the EPI shows good discrimination among the groups in the predicted direction. Our work with the EPI suggests that this is a valuable tool in assessing an individual's feelings and emotional conflicts.

Table IX shows that sex drive is higher among the prison population, which contained a sample of 20 rapists. The results further indicate that sexual aggression is not more prevalent among violent individuals as compared to the other populations.

The Monroe Scale gives support to the theory that a violent population will contain a greater than chance number of temporal lobe epileptics. This tool is a valuable behavioral marker for TLE, but the results of the Monroe cannot be taken as a prima facia indicator of TLE.

MEAN SCORES FOR THE PSYCHOMETRICS ON FOUR POPULATIONS:

CONTROL GROUP

STATE HOSPITAL AMBULATORY SCHIZOPHRENICS

PRISONERS

VIOLENT OUT-PATIENTS SEEN IN THE SCREENING CLINIC

I N D E X

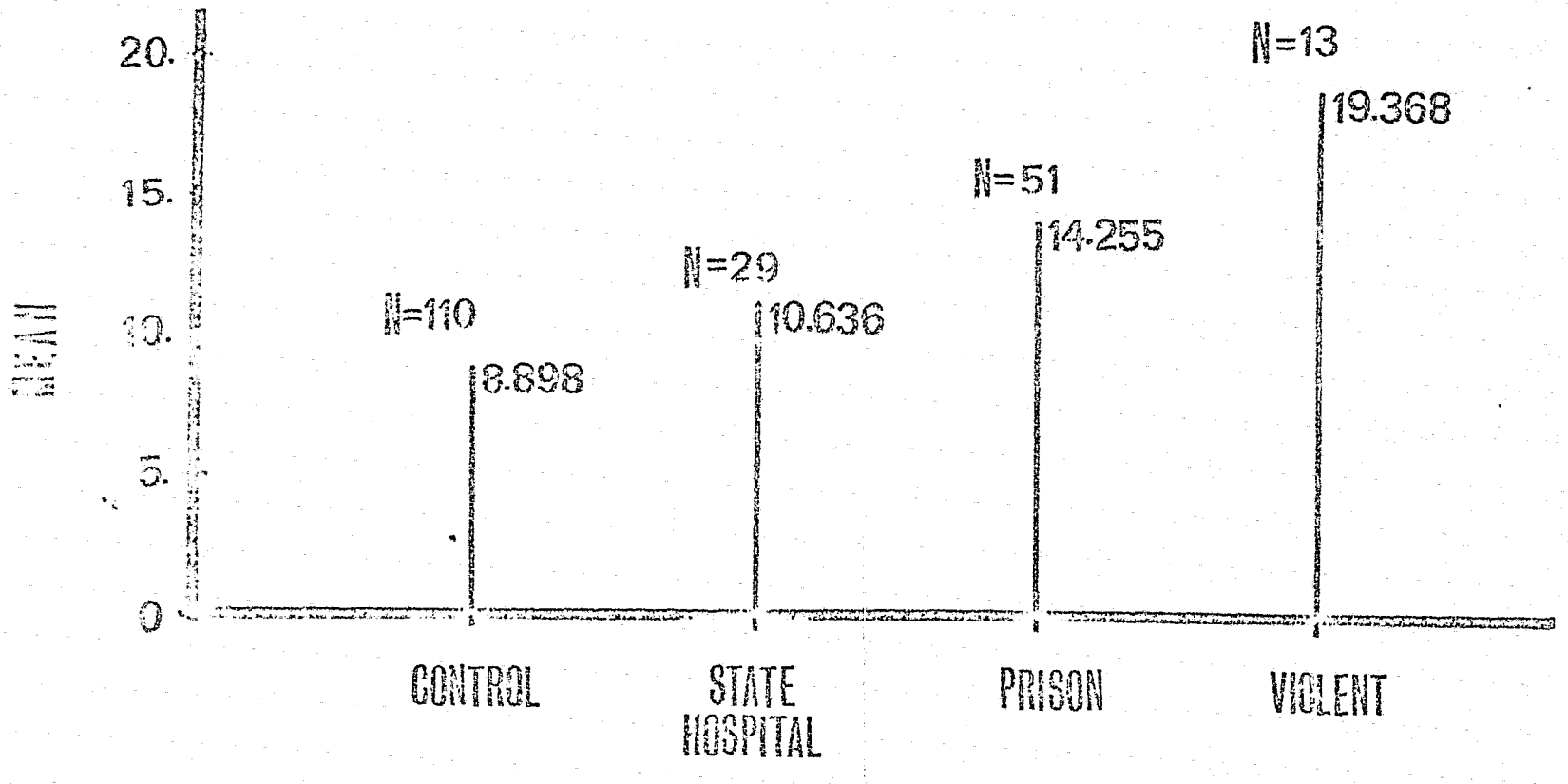
T A B L E I

This data on personal problems is extracted from the "Problem Check List", a modified version of the Mooney Check List. This test is oriented towards overt psychiatric disorders. Items on the scale are grouped into seven major content areas: physical problems, job difficulties, personal, religious, social, family and sexual problems.

The respondent is asked to check any problem that is currently troubling him and to double check any particularly severe problem. A score is obtained for each problem area based on the number of checks in that section.

TABLE I

REPORTED PERSONAL PROBLEMS

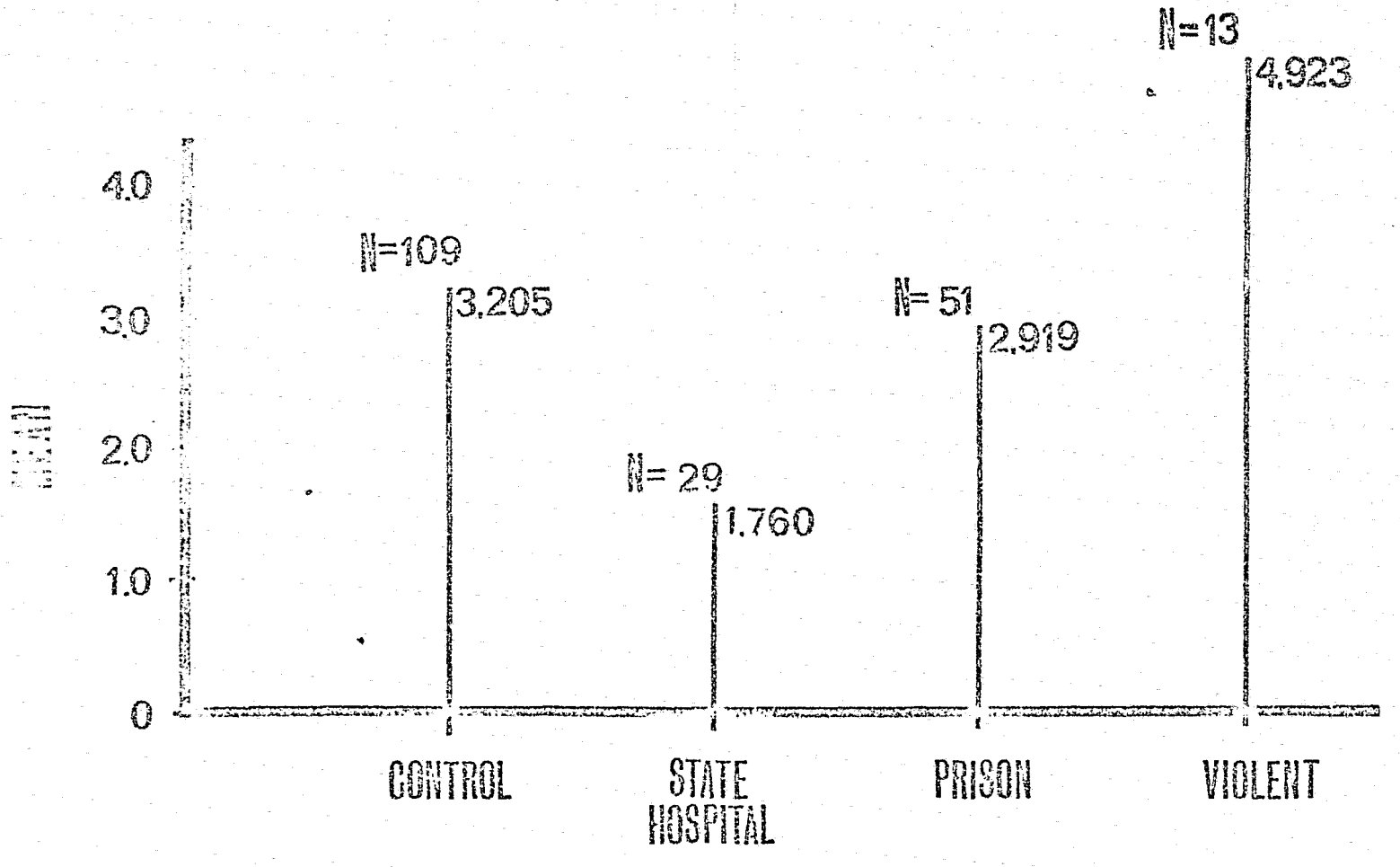


T A B L E II

These scores on religious confusion were also obtained from the Problem Check List in the manner described in Table I.

TABLE II

REPORTED RELIGIOUS CONFUSION

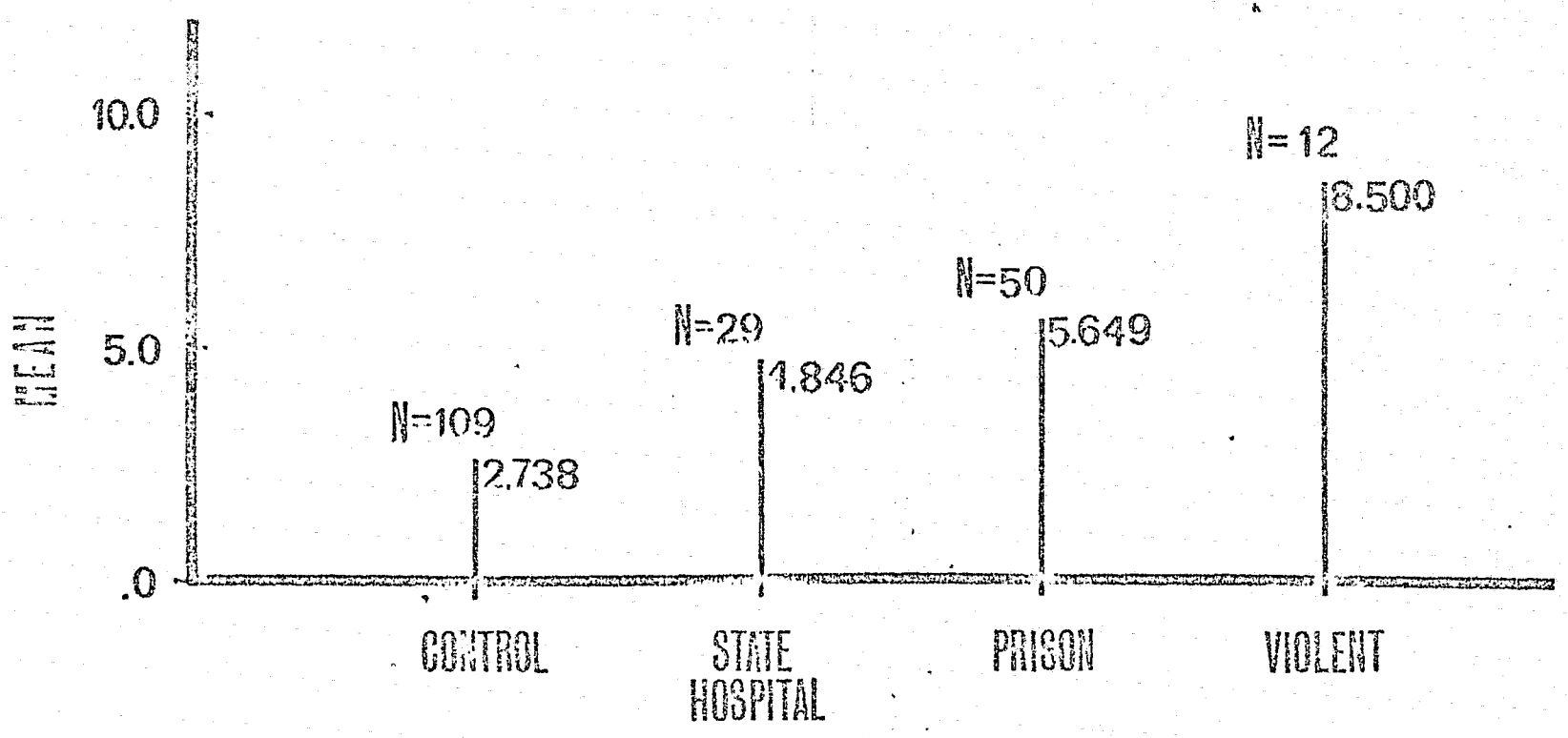


T A B L E III

The contents of this table are derived from the Problem Check List (See description, Table I), social problems section.

TABLE III

REPORTED SOCIAL PROBLEMS



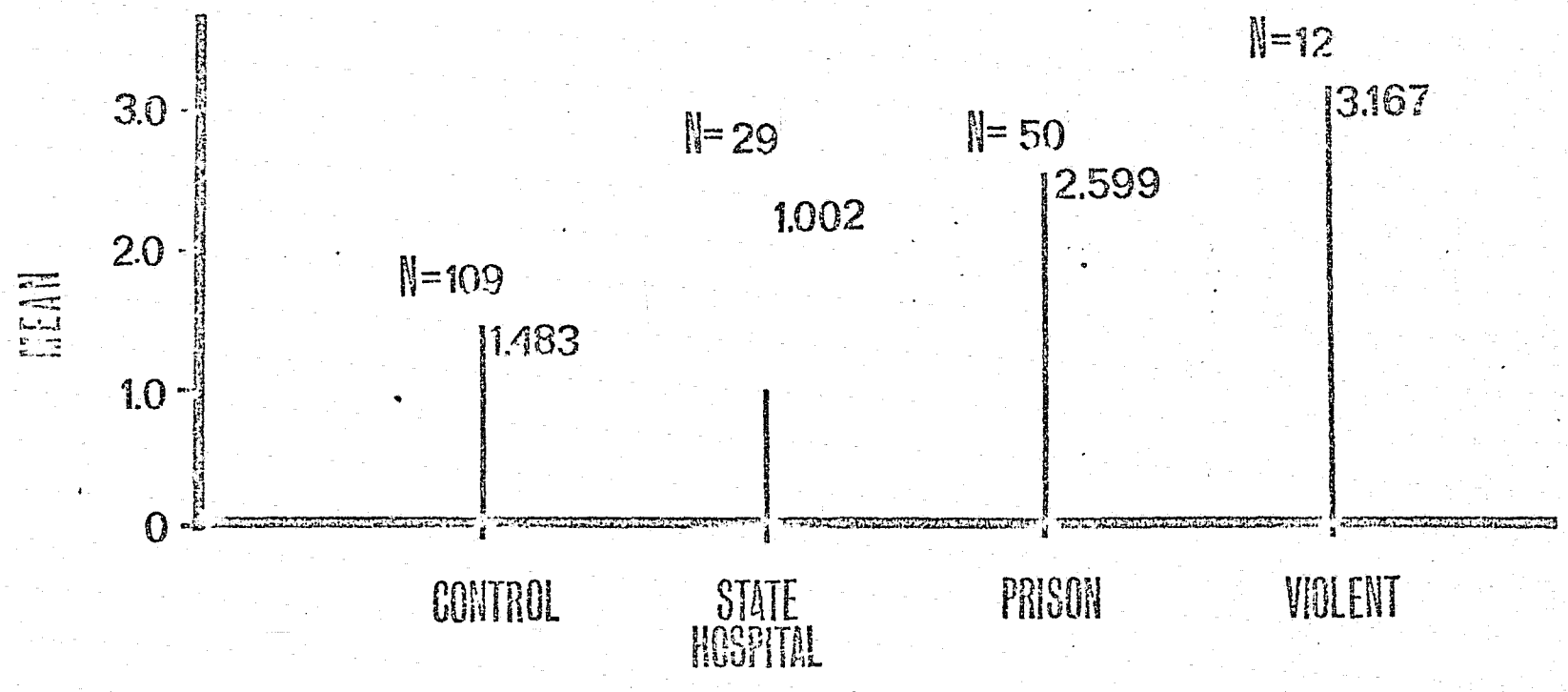
T A B L E IV

This data is based on the respondent's answers to the sexual problems area of the Problem Check List (See Table I, description).

As with the previous tables, the results are stratified, supporting the assumed discriminating power of the tool as well as the hypothesis that violent persons are especially problem-ridden individuals.

TABLE IV

REPORTED SEXUAL PROBLEMS



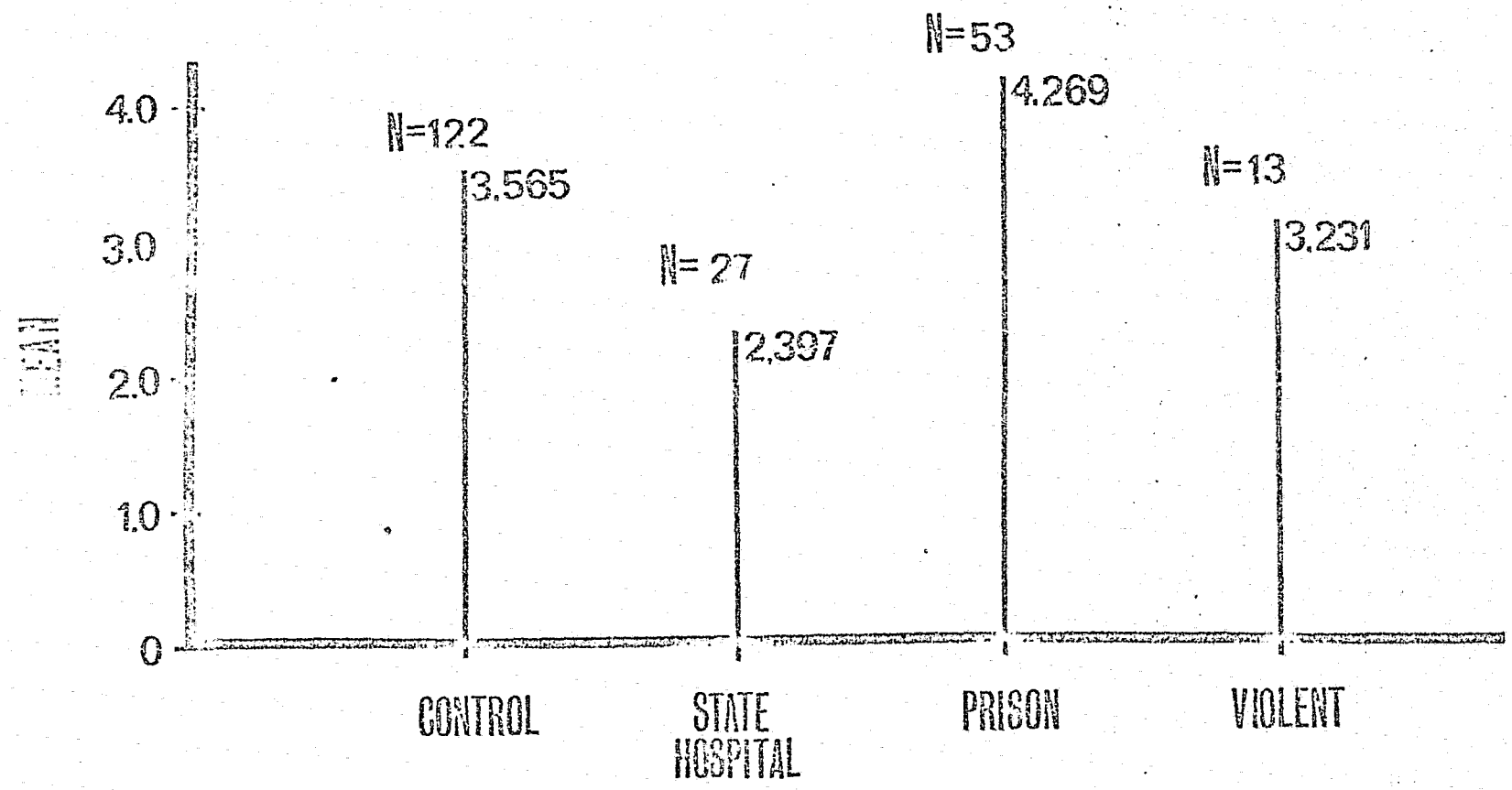
T A B L E V

This data is extracted from questions 24-29, inclusive on the Personal Background Form. These questions relate to parental display of violence and require the respondent to indicate frequency of parental spanking, quarrelling and hitting of one another.

A three point frequency scale has been used: never, sometimes, often. In scoring, the categories are assigned the respective values at 0, 1 and 2. Multiplying frequency by value gives an overall score of family violence.

TABLE V

REPORTED FAMILY VIOLENCE

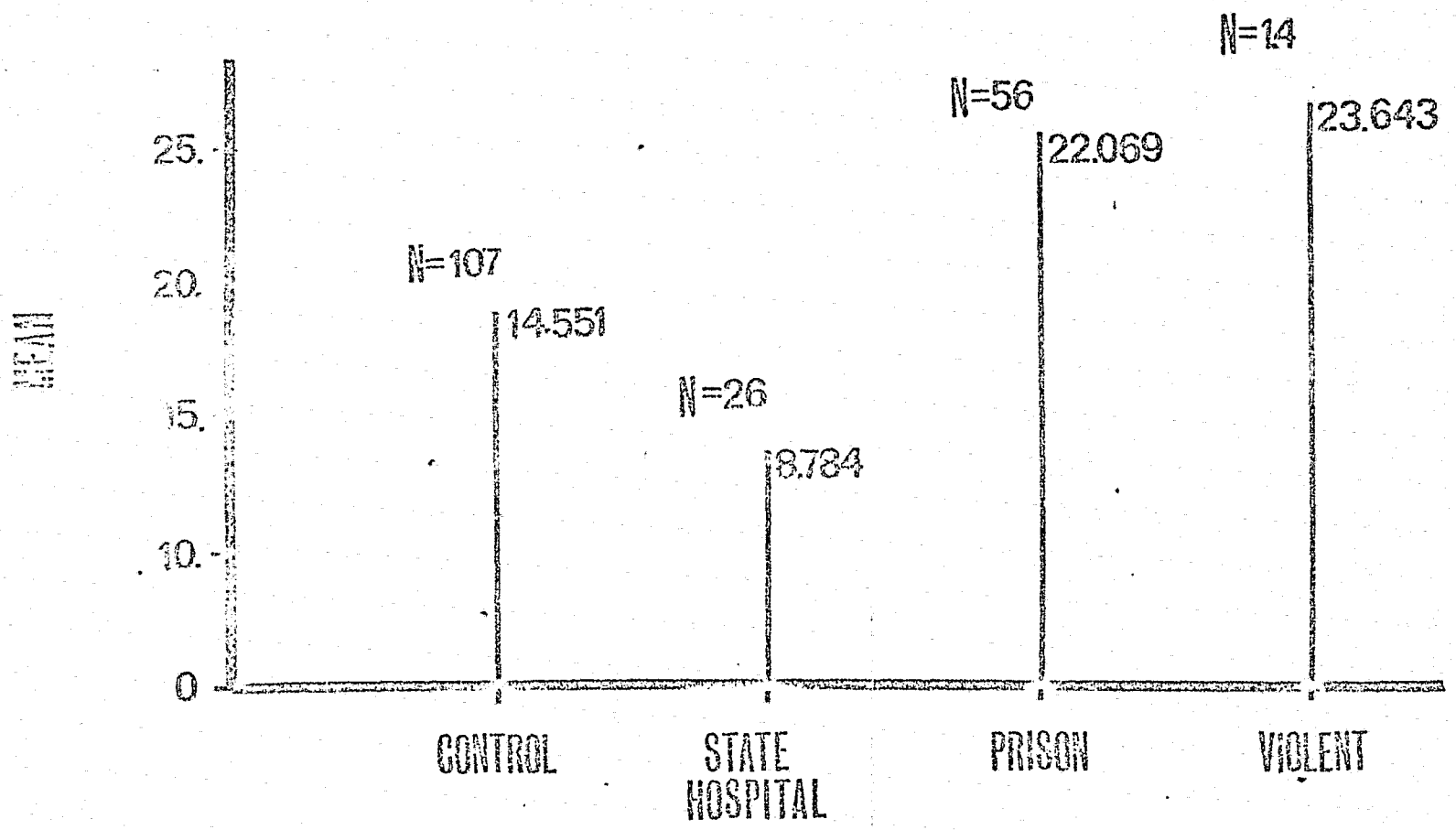


T A B L E VI

This data is the output of the F.A.V. or Feelings-Actions-Violence Questionnaire. This test contains 30 questions relating to an individual's violent emotions and behavior and he is asked to rate them as occurring never, sometimes or often. The values of 0, 1 and 2 are respectively assigned to the frequency categories for purposes of scoring.

TABLE VI

VIOLENCE SCORE — F. A. V.

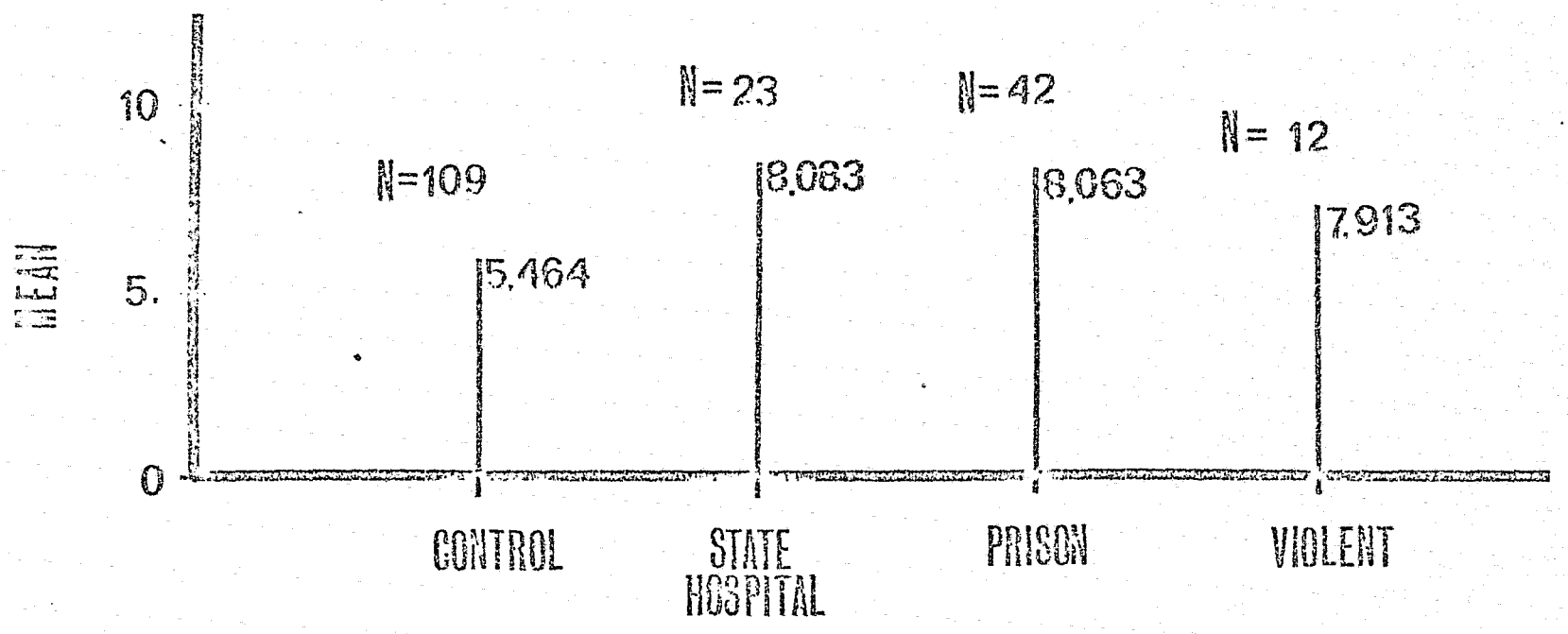


T A B L E VII

This depression score is extracted from one of the seven scales of the Emotions Profile Index (EPI). Developed by Dr. Robert Plutchik, the EPI consists of 12 affect words paired against each other in all possible combinations. The 12 items have been selected to sample all aspects of the trait or emotion language. Each term has then been coded to represent certain implicit emotional states described by Plutchik as the prototype emotions. (The 12 affect words are attached to eight primary emotions (such as depression). Plutchik's theory assumes that all emotions can be conceptualized as mixtures of two or more of these primary emotions. Therefore, each selection from an item pair on the EPI builds up a score for one or more of these primary emotions. The overall score for each emotion is derived by the addition of the total number of checks occurring in that emotion category.

TABLE VII

DEPRESSION - EPI



T A B L E VIII

This measurement of overt anger is also an output of the EPI (See previous table).

QUERT AUER — E.P.I.

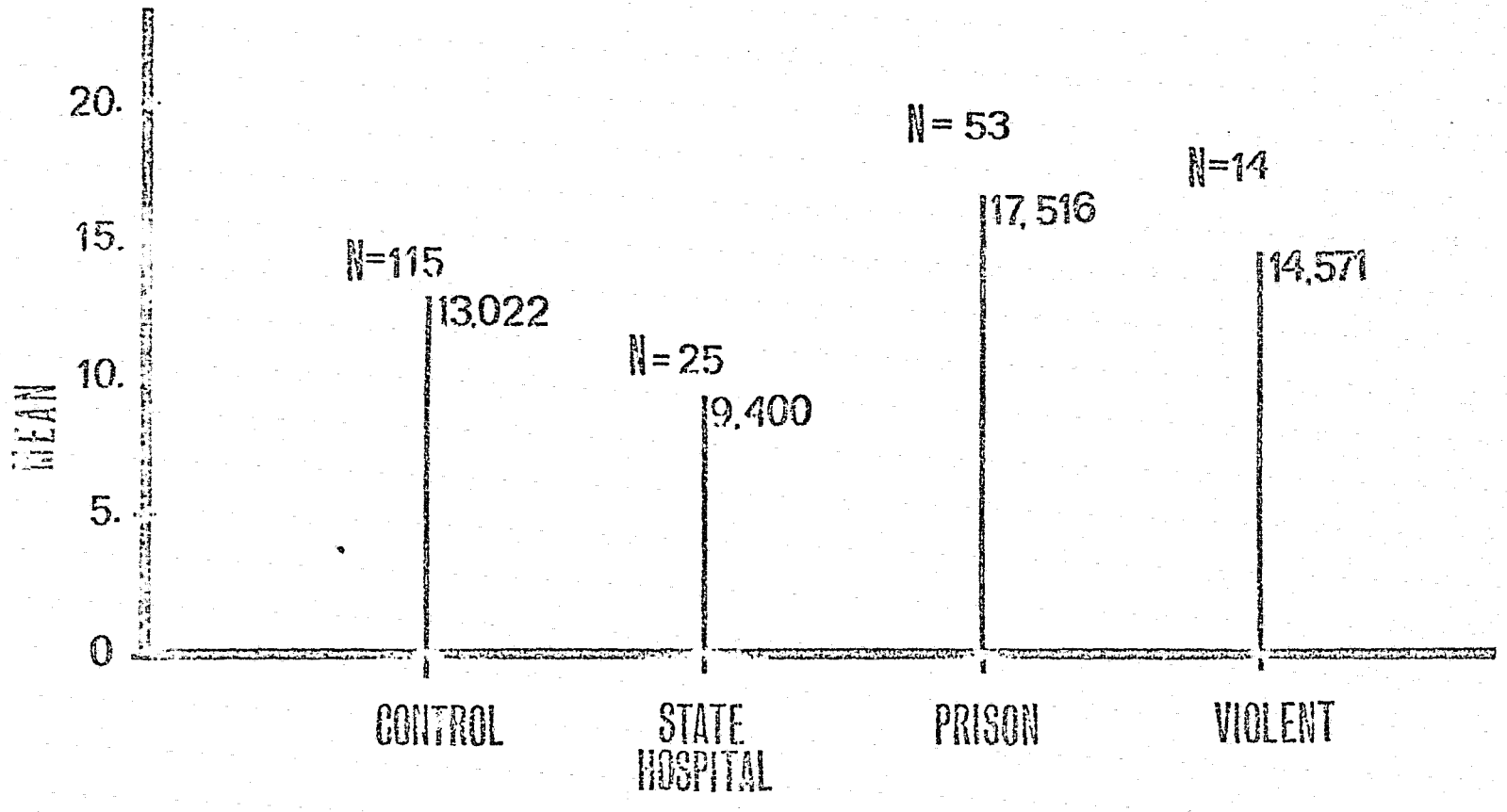
TABLE VIII

T A B L E IX

The Feelings-Actions-Sex (FAS) questionnaire consists of 20 items concerning sexual feelings and behaviors. The respondent is asked to indicate whether each description is true for him using a three-point scale: never, sometimes and often. Assigned the respective values of 0, 1 and 2, these frequencies yield an overall score which reflects an individual's tendency to express sexual drive in overt forms.

TABLE IX

SEX SCORE—FAS

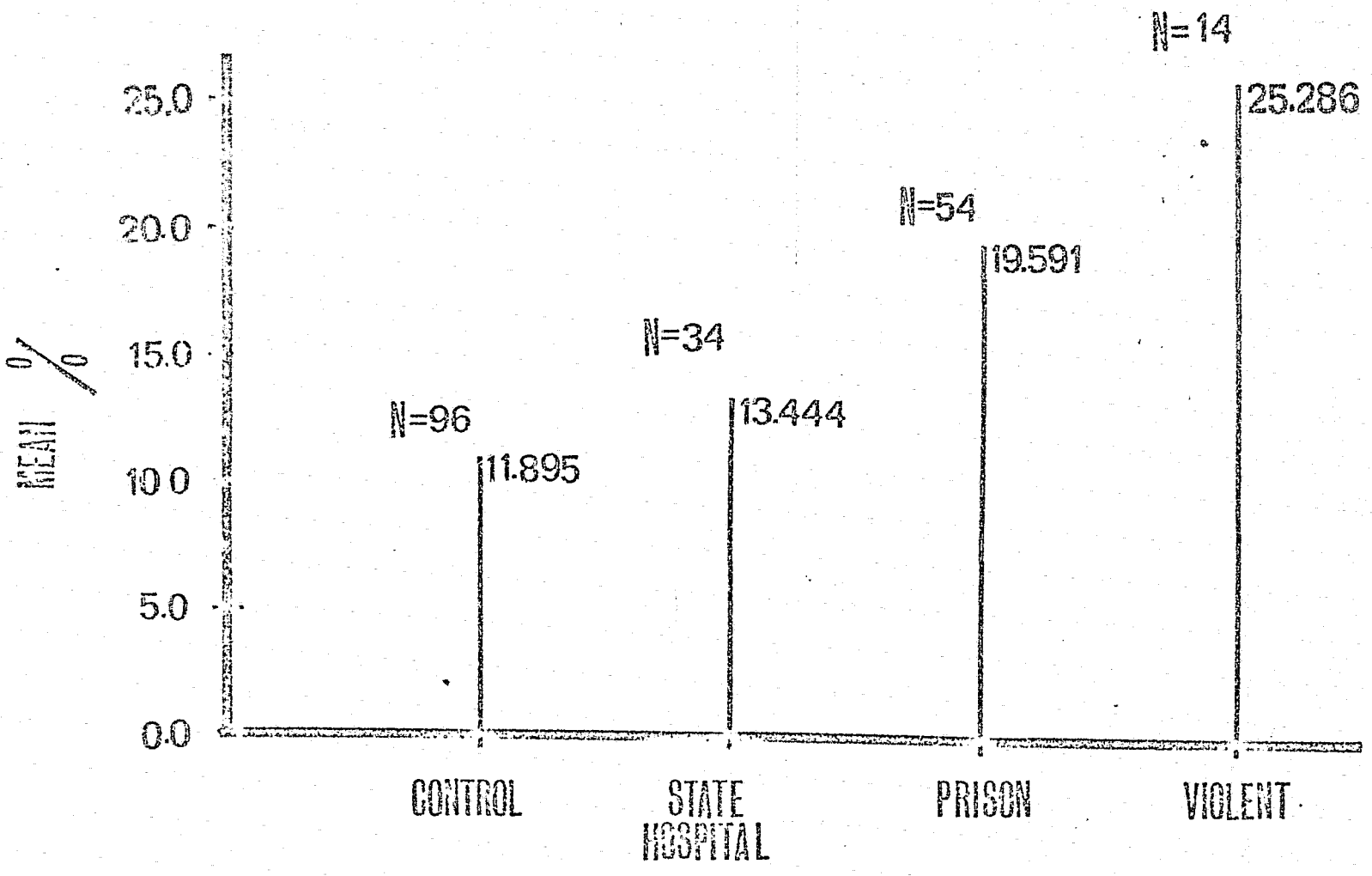


T A B L E X

This data was obtained from the Monroe Scale. Based on the work of Russell Monroe, this tool contains questions related to episodic behavioral disorders and epilepsy. Monroe reported that a review of his clinical records revealed 18 statements often made by patients with "epileptoid" impulsive disorders. These statements have been slightly modified and associated with a four-point frequency scale ranging from never to often and weighted as 0, 1, 2 or 3.

TABLE X

IMPULSIVITY SCORE— MONROE SCALE



B.1.3 Dermatoglyphic Validation Results

B.1.4 Cytogenetics Validation Results

Chromosomal Constitution and Dermatoglyphs

of Inmates of State Treatment Center for Sexual Offenders

Case	Age	Karyotype	Proportion of Cells Affected	TFRC	UL	RL	W	A	Σa-b	Max. ∠atd	I.Q. W.A.J.S.	He
Major Cases												
		Sex chromosomes										
1	26	XXY	All	71	4	2	2	2	73	105	67	63
2	38	XXY	All	3	1	0	0	9	58	101	69	77
3	36	XYY	All	72	10	0	0	0	86	127	97	69
			Means 1-3	49	5	.6	.6	3.6	72	111	77	69
4	24	XY/XXY	>20%	142	4	2	4	0	76	81	120	73
5	22	XY/XYY	>20%	186	5	0	5	0	81	74	118	66
			Means 4-5	164	4.5	1	4.5	0	83	82	119	69
			Means 1-5	95	4.8	.8	2.2	2.2	75	98	94	66
6	24	XY/XO	>20%	291	10	0	0	0	99	158	75	69
		Autosomes										
7	47	Aq^+	All	200	0	2	8	0	86		117	67
Minor Cases												
		Sex Chromosomes										
8	26	XY/XO/XXY	>20%	131	5	1	3	1	84		110	67
9	30	XY/XYY	>20%	123	5	1	3	1	83		110	67
10	48	XY/XYY	>20%	175	5	1	4	0	86		79	71
11	53	XY/XYY	>20%	123	8	1	1	0	85		107	64
12	6.	XY/XXY	>20%	102	9	0	1	0	81		98	66
			Means 8-12	131	6.4	.8	1.4	.4	84		101	67
		Autosomes: nil										

All Inmates

Sex chromosome anomalies	major	6/83	7%	(vs. 0.2% General Population)
	minor	5/83	6%	
Autosome anomalies	major	1/83	1.2%	(vs. 1% General Population)

Glossary:

- TFRC - Total finger ridge count
- UL - Ulnar loop
- RL - Radial Loop
- W - Whorl
- A - Arch
- Σa-b - Sum of ridge counts between palmar a,b triradii
- Max. ∠atd - Maximal angles between a,b,d triradii

Karyotypic and Dermatoglyphic Variation in

69 Males at Lewisburg Federal Penitentiary Sampled Twice

Major Cases and Mosaics (at least 20% cells affected)

#	Karyo	Proportion affected	TFRC	LU	LR	W	A
393	XYY	100%	186	1		9	
185	XYY	100%	140	7		3	
145	XXY	100%	80	6	1	2	1
20	t (Dq+?-)	100%	0				10
309	XY/XO	20%	225			10	

Minor Mosaics (less than 20% cells affected)*

#	Karyo	Proportion affected	TFRC	LU	LR	W	A
90	XY/XXY	9%	100	10			
294	ZY/XYY	6%	74	4		4	4
(205	XY/XO/XYY	8%	74	10)	See below also		

Unestablished Mosaics (insignificant karyotypic changes confined to sex chromosomes and not autosomes, but with dermatoglyphic abnormality)

#	Karyo	Proportion affected	TFRC	LU	LR	W	A
205	XY/XO/XYY	1/1/15	74	10			
99	XY/XO	1/25	115	10			
247	XY/XO	1/5	50	9		1	
84	XY/XO	1/30	60	8		2	

Totals

Sex chromosome anomalies	major	4/69	5%	(vs. .2% General Population)
	minor	3/69	4%	
	other	3/69	4%	
Autosomal anomalies	major	1/69	1.5%	(vs. 1% General Population)

* The limit of mosaicism detectable with 99% confidence in at least one cell out of a random sample of 30 cells.

Dermatoglyphic Variation in 34 Self-referred males and females attending a Hospital Clinic with a Complaint of Violent Behaviour

	p values			
	TFRC	Σa-b	Σ∠atd	FPI
Males all cases	<0.001	<0.40	<0.01	<0.01
cases ascertained at Screening Clinic	<0.01	<0.90	<0.10	<0.05
cases ascertained on Ward	<0.02	<0.90	<0.40	<0.50
cases said to have brain disease	0.01	0.9	0.01	<0.50
Females all cases	<0.10	<0.40	<0.50	<0.10
cases ascertained at Screening Clinic	<0.90	<0.90	<0.90	<0.50
cases ascertained on Ward	<0.05	<0.40	<0.50	<0.50
cases said to have brain disease	0.01	0.4	0.4	<0.9

3. The female sample is too small to allow interpretation, as is the sample ascertained on the Ward.

4. In this study the most useful elements for measuring sexual dimorphism appear to be the total finger ridge count and the finger pattern frequency. Smallness of sample size means that pattern variation (which is spread between seven pattern types over ten fingers as opposed to total finger ridge count which sums one variable) will only be detected in large subsections -- for instance in groups of whorl types rather than by each whorl variant. Similar observations dependent on sample size are seen in the chromosomal disorder Down's Syndrome (mongolism) where changes in whorls and arches both occur, but the former are detected most easily in small samples (because their overall frequency is greater); while deviations in arch frequency only attend analysis of large samples. This suggests the possibility that parallels between dermatoglyphic variation in a known chromosomal disorder and our cases, cover a real genetic basis (putatively chromosomal) for the origin of some cases of behavioural disorder with brain disease.

5. These data confirm the general prediction of an association of variations in dermatoglyphics with behaviour; and tend towards a confirmation of a specific prediction that the association would be mediated via distortion of normal sexual character. [These predictions are based on empirical considerations detailed in: NIMH Contract Proposal Exhibist V (Appendix IV) and VII (Section B p.1-2, 6-7; Tables 1,2&3); and LEAA Grant Proposal Appendix 1 (p11-13; Tables IV-VIII, XI-XIII; Figures 2&3).]

Table 1

Total finger ridge counts, summed palmar a-b ridge counts, summed palmar atd angles and total finger pattern frequencies in males and females ascertained as violent at The Screening Clinic (1), on the Ward (2) or by other referral (3) and, in some cases, found to have organic brain disease

Males	Derm Study #	Ascertainment	TFRC	∠a-b	Σ∠atd
Clutz, C.	1	1 2 4	105	81	86
Wentworth, N.	2	1 4	60	75	75
Kaufman, M.	4	1	90	80	75
Jensen, L.	5	2	-	-	-
Sharp, R.	7	2 4	-	81	74
McCullough, R.	9	2	101	76	-
Jackson, S.	11	3	117	114	76
Buschey, D.	12	2 4	113	83	79
Jordan, T.	13	3	68	80	81
Granese, M.	15	1	131	89	84
Hildreth, W.	17	1 2 4	113	73	71
Carolan, E.	19	1 2	67	83	77
Keeley, W.	20	1 2 4	127	108	75
Dinsmore, P.	23	1	150	73	66
Dorian, R.	24	3	129	92	78
Raymond, J.	28	1	76	94	92
Miller, J.	30	1	156	86	105
Turcotte, C.	31	2 4	167	94	85
Erikson, J.	32	2 4	85	-	67
Miller, R.	35	1 2	169	-	73
Lewis, F.	36	2	149	69	84
Havelin, W.	37	1	84	95	74
N			20.	19.0	20.
x̄			112.85	85.78	78.85
s			34.06	11.80	8.91
t			4.10	1.13	2.61
df			843.	217.	∞
P<			0.001	0.40	0.01
Females					
Bilotta, R.	6	3	13	81	83
Murphy, M.	8	2 4	94	83	-
Allen, H.	10	3 4	101	70	76
Alberetti, A.	29	2	111	-	93
Rogoff, M.	34		165	75	87
Wannemacher, C.	38	1 3 4	59	91	84
Galloway, J.	14	1 4	34	58	118
N			7.	6.	6.
x̄			96.71	76.33	90.17
s			49.52	11.48	14.72
t			1.62	1.01	.69
df			830.	204.	∞
P<			0.10	0.40	0.50

Patterns

	Plain arches	Tented arches	Ulnar loops	Radial loops	Whorls	Double loops	Central pocket loops	Tot.
	1		6		2		1	
	4		6					
			9	1				
			8	2				
	3		5	1			1	
		1	7	1	1			
			8	1	1			
			4		3		2	
			10					
			10					
			9		1			
			8	2				
			8	2				
			3			7		
			4	1	1	4		
			10					
			6		2	2.		
			7		3			
			4	1	1		1	
	2		3		4	3		
			8	2				
			9	1				
Σ	10	1	152	14	19	16	5	Σ = 217
rouped Σ	11		166		35			

χ^2 11.462
df 3. (data grouped as above because of small sample size)
P< 0.01

	5		4					
			10					
			7	1	2			
			10					
			3	1	2	3	1	
		1	9					
	1		6	1	2			
Σ	6	1	49	3	6	3	1	Σ = 70
grouped Σ	7		52			10		

χ^2 2.59
df 2. (data grouped as above because of small sample size)
P< 0.50

Table 2

Total finger ridge counts, summed palmar a-b ridge counts, summed palmar atd angles and total finger pattern frequencies in males ascertained as violent at The Screening Clinic

Study No.	Males	TFRC	Σa-b	Σatd	Arches PA	Arches TA	Loops UL	Loops RL	Whorls W	Whorls DL	C P L
1.	Clutz, C.	105	81	86	1		6		2		1
2.	Wentworth, W.	60	75	75	4		6				
4.	Kaufman, M.	90	80	75			9	1			
15.	Granese, M.	131	89	84			10				
17.	Hildreth, W.	113	73	71			9		1		
19.	Carolan, E.	67	83	77			8	2			
20.	Keeley, W.	127	108	75			8	2			
23.	Dinsmore, P.	150	73	66			3			7	
28.	Raymond, J.	76	94	92			10				
30.	Miller, J.	156	86	105			6		2	2	
35.	Miller, R.	169	-	73			3		4	3	
37.	Havelin, W.	84	95	74			9	1			
	Σ				5	0	87	6	9	12	1
	N	12.	11.	12.							
	$\bar{x}$	110.67	85.18	79.42							
	s	36.35	10.77	10.72							
	t	3.22	0.78	1.6							
	χ^2				12.53						
	df	834.	210.	∞	5. (data grouped as above because of						
	P<	0.01	0.90	0.10	0.05	small sample size)					

Females

38.	Wanpemacher, C.	59	91	84		1	9				
14.	Galloway, J.	134	58	118	1		6	1		2	
	Σ				1	1	15	1	0	2	0
	grouped Σ				2		16		2		
	N	2.	2.	2.							
	$\bar{x}$	96.50	76.50	101.							
	s	53.03	23.33	24.04							
	t	0.82	0.46	0.88							
	χ^2				1.53						
	df	826.	200.	∞	2. (data grouped as above because of						
	P<	0.90	0.90	0.90	0.50	small sample size)					

Table 3

Total finger ridge counts, summed palmar a-b ridge counts, summed palmar atd angles, and total finger pattern frequencies in males and females ascertained on the ward

Study No.	Males	TFRC	Σa-b	Σatd	Arches PA	Arches TA	Loops UL	Loops RL	Whorls W	Whorls DL	C P L	Tot
1.	Clutz, C.	105	81	86	1		6	1	2		1	
7.	Sharp, R.	-	81	74	3		5				1	
12.	Buschey, D.	113	83	79			4		3		2	
13.	Jordan, T.	68	80	81			10					
17.	Hildreth, W.	113	73	71			9		1			
20.	Keeley, W.	127	108	75			8	2				
31.	Turcotte, C.	167	94	85			7		3			
32.	Erikson, J.	85	-	67	2		4	1	1		1	
36.	Lewis, F.	149	69	84			8	2				
	Σ				6	0	61	6	10	0	5	34
	N	8.	8.	9.								
	$\bar{x}$	115.88	83.63	78.								
	s	32.10	12.28	6.65								
	t	2.53	0.24	0.97								
	χ^2				2.70							
	df	831.	206.	∞	4. (data grouped as above because of							
	P<	0.02	0.90	0.40	0.50	small sample size)						

Females

8.	Murphy, M.	94	83	-			10					
10.	Allen, H.	101	76	76			7	1	2			
29.	Alberetti, A.	111	-	93			10					
38.	Wannemacher, C.	59	91	84		1	9					
14.	Galloway, J.	134	58	118	1		6	1	2			
	Σ				1	1	42	2	4	0	0	50
	N	5.	4.	4.								
	$\bar{x}$	99.80	75.50	92.75								
	s	27.62	14.53	18.21								
	t	2.20	1.17	0.74								
	χ^2				4.84							
	df	828.	202.	∞	4. (data grouped as above because of							
	P<	0.05	0.40	0.50	0.50	small sample size)						

Table 4

Total finger ridge counts, summed palmar a-b ridge counts, summed palmar atd angles, and total pattern frequencies in males and females said to have violent behavior accompanied by brain disease

Study No.	Males	TFRC	∠a-b	∠atd	Arches PA	Arches TA	Loops UL	Loops RL	Whorls W	Whorls DL	C P L	Tot
1.	Clutz, C.	105	81	86	1		6		2			
2.	Wentworth, N.	60	75	75	4		6				1	
7.	Sharp, R.	-	81	74	3		5	1			1	
12.	Buschey, D.	113	83	79			4		3		2	
17.	Hildreth, W.	113	73	71			9		1			
20.	Keeley, W.	127	108	75			8	2				
31.	Turcotte, C.	167	94	85			7		3			
32.	Erikson, J.	85	-	67	2		4	1	1		1	
	Σ				10	0	49	4	10	0	5	
	grouped Σ				10		53		10		5	78
	N	7.	7.	8.								
	$\bar{x}$	110.	85.	76.5								
	s	33.43	12.18	6.55								
	t	2.76	0.42	3.06								
	χ^2				6.84							
	df	830.	429.	106.	4. (data grouped as above because of							
	P<	0.01	0.9	0.01	0.50		small sample size)					

Females

8.	Murphy, M.	94	83	-			10					
10.	Allen, H.	101	70	76			7	1	2			
38.	Wannemacher, C.	59	91	84		1	9					
14.	Galloway, J.	134	58	118	1		6	1	2			
	Σ				1	1	32	2	4	0	0	
	grouped Σ				2		34		4			40
	N	4.	4.	3.								
	$\bar{x}$	97.	75.5	92.67								
	s	30.76	14.53	9.63								
	t	1.94	1.03	1.17								
	χ^2				1.21							
	df	827.	437.	101.	2. (data grouped as above because of							
	P<	0.01	0.4	0.4	0.9		small sample size)					

B.2 Computer Programs

B.2.1 Dermatoglyphic Computer Programs

Program Name (Language)	Type of Machine	Description of Input	Program Function
BW1 (Cobol)	IBM/370	Bridgewater Fingerprint Data	Determine pattern type of fingerprints, based on the ridge counts (completed 12/71)
BW2 (Data Text)	IBM/370	Bridgewater - Fingerprint Data with patterns	Obtain statistics and frequency distributions of ridge counts, patterns, and pattern specific ridge counts (completed 2/72)
LBFIX (PL/I)	IBM/370	Lewisburg Fingerprint Data	Reverse radial and ulnar ridge counts (completed 12/71)
LB1 (SPSS)	IBM/370	Lewisburg Fingerprint Data	Obtain statistics, frequency distributions and histograms of ridge counts (completed 1/72)
LB2 (SPSS)	IBM/370	Lewisburg Fingerprint Data	Obtain statistics, frequency distributions and histograms of patterns (completed 1/72)
LB3 (SPSS)	IBM/370	Lewisburg Fingerprint Data	Obtain statistics, frequency distributions and histograms of pattern specific ridge counts (completed 1/72)
NEWANN (FORTRAN)	IBM/370	Lewisburg - all social, psychiatric, medical & physical data collected	Establish 36 categories of Lewisburg subjects (estimated completion 5/72)
LBMERGE (PL/I)	IBM/370	Lewisburg - Fingerprint Data & 36 variables defined in NEWANN	Combine fingerprint and 36 variable information (estimated completion 6/72)
FHLIST (COBOL)	IBM/370	Framingham - all social, psychiatric, medical & physical data collected	List the dermatoglyphic data for any or all subjects (completed 1/72)
FHADD (COBOL)	IBM/370	New dermatoglyphic data	Replace the old or missing dermatoglyphic information for certain subjects with newly recorded data (completed 2/72)
FHEDIT (PL/I)	IBM/370	Framingham - all social, psychiatric, medical & physical data collected	Check range and validity of numeric variables on the Framingham file (completed 4/72)

Program Name (Language)	Type of Machine	Description of Input	Program Function
FACOR (PL/I)	IBM/370	All social, psychiatric, medical & physical data collected at Framingham. List of variables with errors.	Change invalid data to an acceptable format (estimated completion 5/72)
MBIEDIT (COBOL)	IBM/370	MBI fingerprint data	Range check & check validity of the ridge counts, patterns and identification information (completed 3/72)
MBIFIX (PL/I)	IBM/370	MBI fingerprint data	Reverse radial and ulnar ridge counts and develop pattern codes (completed 3/72)
MBI1 (SPSS)	IBM/370	MBI fingerprint data	Distribution and histograms of ridge counts (estimated completion 5/72)
MBI2 (SPSS)	IBM/370	MBI fingerprint data	Obtain statistics, frequency distributions and histograms of patterns (completed 4/72)
MBI3 (SPSS)	IBM/370	MBI fingerprint data	Obtain statistics, frequency distributions and histograms of pattern specific ridge counts (estimated completion 5/72)
STATPR (COBOL)	IBM/370	Tape of NYSIIS Data (STATPRINT)	Prints frequency distributions (completed 4/72)
FTDTA (JOSS)	PDP-7	Fingerprint data	Stores fingerprint data and other variables on dectape (modification completed 4/72)
FRQF (JOSS)	PDP-7	Dectape with fingerprint data on it	Creates frequency distributions and optionally plots them (modification completed 4/72)
FREQOUT A (JOSS)	PDP-7	Data entered by user	Creates frequency distributions and optionally plots them (completed 2/72)
FREQOUT L (JOSS)	PDP-7	Previously obtained frequency distribution entered by user	Accepts data and creates one or more plots (completed 2/72)

Program Name (Language)	Type of Machine	Description of Input	Program Function
FREQOUT C	PDP-7	Previously obtained frequency distribution entered by user (different format from FREQOUTB)	Accepts data and creates one or more plots (completed 2/72)
TFRC	Hewlett-Packard 9810A	Ridge Counts entered by user	Computes TFRC (completed 12/71)
Chi-Square	Hewlett-Packard 9810A	4 observations of any type entered by user	Computes Chi-Square (completed 1/72)
RH1	Hewlett-Packard 9810A	X,Y coordinates entered by user	Draws a graph with the H-P plotter by connecting the points defined by the user (completed 12/71)
RH2	Hewlett-Packard 9810A	Frequencies entered by User (any type of data)	Draws a frequency histogram with the H-P plotter (completed 1/72)
T-Test for large samples	Hewlett-Packard 9810A	Mean, Standard deviation & number of subjects for 2 samples entered by user	Computes T-value (significance) and number of degrees of freedom (completed 2/72)
FRED	Hewlett-Packard 9810A	Values to be grouped are entered by user (any type of data)	Creates a frequency distribution of up to 100 categories (completed 4/72)
FREDA	Hewlett Packard 9810A	Previously created frequency distribution is entered by user	Stores frequency distribution so it can be accessed for use in creating a histogram (completed 4/72)

Program Name (Language)	Type of Machine	Description of Input	Program Function
HIST	Hewlett-Packard 9810A	Frequency Distribution created by using FRED or FREDA	Prints histogram of 1 to 100 categories (completed 4/72)

PROGRAM LISTING OF FRED
(See p. 3 of Data Center Programs)

```
0000--GTO---44
0001--S/R---77
0002--LBL---51
0003-- YE---24
0004--GTO---44
0005--S/R---77
0006--LBL---51
0007--EEX---26
0008--LBL---51
0009--XEY---30
0010--GTO---44
0011--S/R---77
0012--LBL---51
0013-- - ---34
0014--GTO---44
0015--S/R---77
0016--LBL---51
0017--PNT---45
0018--STP---41
0019--GTO---44
0020--LBL---51
0021--XFR---67
0022--LBL---51
0023-- YE---24
0024--GTO---44
0025--S/R---77
0026--LBL---51
0027-- 0 ---00
0028-- A ---62
0029-- O ---71
0030-- K ---55
0031-- 1 ---01
0032-- 3 ---03
0033--XTO---23
0034-- 1 ---01
0035-- 0 ---00
0036-- 4 ---04
0037--LBL---51
0038--1/X---17
0039--CLR---20
0040--FMT---42
[illegible]
0042-- E ---60
0043-- N ---73
0044--YTO---23
0045-- E ---60
0046-- o ---13
0047--CLR---20
0048--GTO---44
0049--CNT---47
[illegible]
[illegible]
0052--XTO---23
0053--YTO---40
0054--FMT---42
0055--STP---41
0056--PNT---45
0057--XTO---23
0058-- 1 ---01
0059-- 0 ---00
0060-- 8 ---10
0061--CNT---47
0062-- UP---27
0063-- 1 ---01
0064-- 0 ---00
0065-- 0 ---00
0066--X<Y---52
0067--GTO---44
0068--S/R---77
0069--LBL---51
0070--LBL---51
0071--1/X---17
0072--CNT---47
0073--FMT---42
0074--FMT---42
0075-- C ---61
0076-- A ---62
0077--XTO---23
0078--CNT---47
0079--IND---31
0080-- I ---65
0081-- D ---63
0082--XTO---23
0083-- H ---74
0084--FMT---42
0085--STP---41
0086--PNT---45
0087--XTO---23
0088-- 1 ---01
0089-- 0 ---00
0090-- 7 ---07
0091--FMT---42
0092--FMT---42
0093-- O ---71
0094-- F ---16
0095-- F ---16
0096--YTO---40
0097-- E ---60
0098--XTO---23
0099--FMT---17
[illegible]
0101--PNT---45
0102--PNT---45
0103--XTO---23
0104-- 1 ---01
0105-- 0 ---00
0106-- 6 ---06
0107-- UP---27
0108--XFR---67
0109-- 1 ---01
0110-- 0 ---00
0111-- 7 ---07
0112-- UP---27
0113--XFR---67
0114-- 1 ---01
0115-- 0 ---00
0116-- 8 ---10
0117-- X ---36
0118-- DN---25
0119-- + ---33
0120--YTO---40
0121-- 1 ---01
0122-- 0 ---00
0123-- 5 ---05
0124--FMT---42
0125--FMT---42
0126-- D ---63
0127-- A ---62
0128--XTO---23
0129-- A ---62
0130--CLR---20
0131--CLR---20
0132--FMT---42
0133--S/R---77
0134--LBL---51
0135--EEX---26
0136--STP---41
0137--IFG---43
0138--CNT---47
0139--S/R---77
0140--CNT---47
0141--CNT---47
[illegible]
0143--S/R---77
0144--LBL---51
0145--IND---31
0146--GTO---44
0147--LBL---51
0148--EEX---2[illegible]
[illegible]
[illegible]
```

Program Listing of FRED (continued)

```
0151--CLR---20
0152-- 1 ---01
0153-- 0 ---00
0154-- 8 ---10
0155--XTO---23
0156-- b ---14
0157--LBL---51
0158--DIV---35
0159-- 0 ---00
0160--XTO---23
0161--IND---31
0162-- a ---13
0163--XFR---67
0164-- a ---13
0165--XEY---30
0166-- 1 ---01
0167-- + ---33
0168-- b ---14
0169--YTO---40
0170-- a ---13
0171--X>Y---53
0172--GTO---44
0173--LBL---51
0174--DIV---35
0175--CNT---47
0176--X=Y---50
0177--GTO---44
0178--LBL---51
0179--DIV---35
0180--CNT---47
0181--CLR---20
0182--S/R---77
0183--LBL---51
0184--XSQ---12
0185--FMT---42
0186--FMT---42
0187-- I ---65
0188-- N ---73
0189--INT---64
0190-- 9 ---62
0191-- L ---72
[illegible]
0193-- D ---63
0194--FMT---42
0195--SFL---54
0196--S/R---77
0197--LBL---51
0198-- π ---56
[illegible]

0201-- 1 ---01
0202-- 0 ---00
0203-- 5 ---05
0204--XEY---30
0205--X<Y---52
0206--GTO---44
0207--LBL---51
0208--RUP---22
0209--CNT---47
0210--GTO---44
0211--S/R---77
0212--LBL---51
0213--XSQ---12
0214--S/R---77
0215--LBL---51
0216--RUP---22
0217-- UP---27
0218--XFR---67
0219-- 1 ---01
0220-- 0 ---00
0221-- 6 ---06
0222--X>Y---53
0223--GTO---44
0224--S/R---77
0225--LBL---51
0226--XSQ---12
0227--S/R---77
0228--LBL---51
0229--XTO---23
0230--YTO---40
0231-- b ---14
0232-- - ---34
0233--XFR---67
0234-- 1 ---01
0235-- 0 ---00
0236-- 7 ---07
0237--DIV---35
0238-- 3 ---03
0239-- + ---33
0240-- YE---24
0241-- a ---13
0242--S/R---77
0243-- 1 ---01
0244--XTO---23
0245--IND---31
0246-- + ---33
0247-- a ---13
0248--S/R---77
[illegible]---51
[illegible]---21

0251--FMT---42
0252--GTO---44
0253--S/R---77
0254--LBL---51
0255-- π ---56
0256--IFG---43
0257--GTO---44
0258--LBL---51
0259-- DN---25
0260--CNT---47
0261--GTO---44
0262--S/R---77
0263--LBL---51
0264--XTO---23
0265-- 1 ---01
0266--XTO---23
0267--IND---31
0268-- + ---33
0269-- a ---13
0270--CNT---47
0271-- b ---14
0272-- O ---71
0273--CLR---20
0274--LBL---51
0275-- DN---25
0276--CNT---47
0277--S/R---77
0278--LBL---51
0279--CHS---22
0280-- 1 ---01
0281--XTO---23
0282--IND---31
0283-- - ---34
0284-- a ---13
0285-- b ---14
0286-- F ---16
0287-- O ---71
0288--S/R---77
0289--LBL---51
0290-- - ---34
0291--FMT---42
0292--FMT---42
0293-- C ---61
0294-- O ---71
0295-- a ---13
0296-- a ---13
0297-- E ---60
0298-- C ---61
[illegible]
0300--[illegible]
```

Program Listing of Fred (continued)

```
0301--LBL---51
0302-- r ---76
0303--STP---41
0304--IFG---43
0305--GTO---44
0306--LBL---51
0307-- + ---33
0308--CNT---47
0309--PNT---45
0310--GTO---44
0311--S/R---77
0312--LBL---51
0313-- π ---56
0314--IFG---43
0315--GTO---44
0316--LBL---51
0317-- r ---76
0318--CNT---47
0319--GTO---44
0320--S/R---77
0321--LBL---51
0322--XTO---23
0323--GTO---44
0324--S/R---77
0325--LBL---51
0326--CHS---32
0327--GTO---44
0328--LBL---51
0329-- r ---76
0330--LBL---51
0331-- + ---33
0332--FMT---42
0333--FMT---42
0334-- A ---62
0335-- D ---63
0336-- D ---63
0337--FMT---42
0338--LBL---51
0339-- UP---27
0340--STP---41
0341--IFG---43
0342--CNT---47
0343--S/R---77
0344--CNT---47
0345--CNT---47
0346--GTO---44
0347--S/R---77
0348--LBL---51
[illegible]
[illegible]
```

```
0351--LBL---51
0352-- UP---27
0353--LBL---51
0354--PNT---45
0355--FMT---42
0356--FMT---42
0357--CLR---20
0358--CLR---20
0359-- M ---70
0360-- E ---60
0361-- A ---62
0362-- N ---73
0363--CLR---20
0364--INT---64
0365-- A ---62
0366-- a ---13
0367--CNT---47
0368--CLR---20
0369--YTO---40
0370-- . ---21
0371-- D ---63
0372-- . ---21
0373--CLR---20
0374-- N ---73
0375--CLR---20
0376--FMT---42
0377-- C ---61
0378--PNT---45
0379-- D ---63
0380--PNT---45
0381-- r ---76
0382--PNT---45
0383--XFR---67
0384-- 0 ---00
0385-- 0 ---00
0386-- 0 ---00
0387--PNT---45
0388--PNT---45
0389--S/R---77
0390--LBL---51
0391--XFR---67
0392--FMT---42
0393--FMT---42
0394-- F ---16
0395-- a ---13
0396-- E ---60
0397-- b ---14
0398--CNT---47
[illegible]
[illegible]
```

```
[illegible]
0402-- L ---72
0403-- E ---60
0404--CLR---20
0405--CLR---20
0406-- C ---61
0407-- A ---62
0408--XTO---23
0409--CNT---47
0410--GTO---44
0411--CLR---20
0412-- F ---16
0413-- a ---13
0414-- E ---60
0415-- b ---14
0416--CLR---20
0417--X=Y---50
0418--CLR---20
0419--CLR---20
0420--FMT---42
0421-- 1 ---01
0422--CHS---32
0423--XTO---23
0424-- b ---14
0425-- 1 ---01
0426--LBL---51
0427--CNT---47
0428--XTO---23
0429-- a ---13
0430--PNT---45
0431-- b ---14
0432-- UP---27
0433-- 1 ---01
0434-- + ---33
0435--XFR---67
0436-- 1 ---01
0437-- 0 ---00
0438-- 4 ---04
0439-- + ---33
0440--YTO---40
0441-- b ---14
[illegible]
0443--IND---31
0444-- b ---14
0445--PNT---45
0446-- UP---27
0447--XFR---67
0448-- 0 ---00
[illegible]
[illegible]
```

Program Listing of FRED (continued)

```
0451--DIV---35
0452--  DN---25
0453--FNT---45
0454--FNT---45
0455--XFR---67
0456--  1  ---01
0457--  0  ---00
0458--  8  ---10
0459--XEY---30
0460--  a  ---13
0461--  UP---27
0462--  1  ---01
0463--  +  ---33
0464--  DN---25
0465--XTO---23
0466--  a  ---13
0467--  0  ---00
0468--XTO---23
0469--  1  ---01
0470--  0  ---00
0471--  4  ---04
0472--  a  ---13
0473--X:Y---52
0474--GTO---44
0475--LBL---51
0476--CNT---47
0477--CNT---47
0478--X=Y---50
0479--GTO---44
0480--LBL---51
0481--CNT---47
0482--CNT---47
0483--FNT---42
0484--FNT---42
0485--CLR---20
0486--CLR---20
0487--CLR---20
0488--CLR---20
0489--CLR---20
0490--CLR---20
0491--CLR---20
0492--FNT---42
0493--LBL---51
0494--PSE---57
0495--XFR---67
0496--  1  ---01
0497--  0  ---00
0498--  8  ---10
0499--  .  ---..
```

```
0501--  +  ---33
0502--YTO---40
0503--  1  ---01
0504--  0  ---00
0505--  8  ---10
0506--GTO---44
0507--S/R---77
0508--LBL---51
0509--  1  ---01
0510--  2  ---02
0511--  X  ---36
0512--  1  ---01
0513--  3  ---03
0514--  +  ---33
0515--  1  ---01
0516--  4  ---04
0517--DIV---35
0518--  DN---25
0519--INT---64
0520--  UP---27
0521--  2  ---02
0522--DIV---35
0523--YTO---40
0524--  b  ---14
0525--  DN---25
0526--FNT---42
0527--FNT---42
0528--  E  ---60
0529--  A  ---62
0530--  C  ---31
0531--  H  ---74
0532--CNT---47
0533--  X  ---36
0534--CNT---47
0535--  E  ---60
0536--  b  ---14
0537--1/X---17
0538--  A  ---62
0539--  L  ---72
0540--YTO---40
0541--CNT---47
0542--PNT---45
0543--  2  ---02
0544--XTO---23
0545--  a  ---13
0546--LBL---51
0547--  2  ---02
0548--XFR---67
0549--  .  ---..
```

```
0551--  0  ---10
0552--  UP---27
0553--  a  ---13
0554--CNT---47
0555--X>Y---53
0556--GTO---44
0557--LBL---51
0558--  8  ---10
0559--CNT---47
0560--X=Y---50
0561--GTO---44
0562--LBL---51
0563--  8  ---10
0564--CNT---47
0565--  UP---27
0566--  1  ---01
0567--  +  ---33
0568--YTO---40
0569--  a  ---13
0570--GTO---44
0571--S/R---77
0572--LBL---51
0573--  B  ---66
0574--GTO---44
0575--LBL---51
0576--  X  ---36
0577--CNT---47
0578--LBL---51
0579--  1  ---01
0580--CLR---20
0581--  3  ---03
0582--LBL---51
0583--YTO---40
0584--XTO---23
0585--  a  ---13
0586--XFR---67
0587--IND---31
0588--  a  ---13
0589--X>Y---53
0590--  UP---27
0591--CNT---47
0592--CNT---47
0593--CNT---47
0594--  a  ---13
0595--  UP---27
0596--  1  ---01
0597--  +  ---33
0598--YTO---40
0599--  .  ---..
```

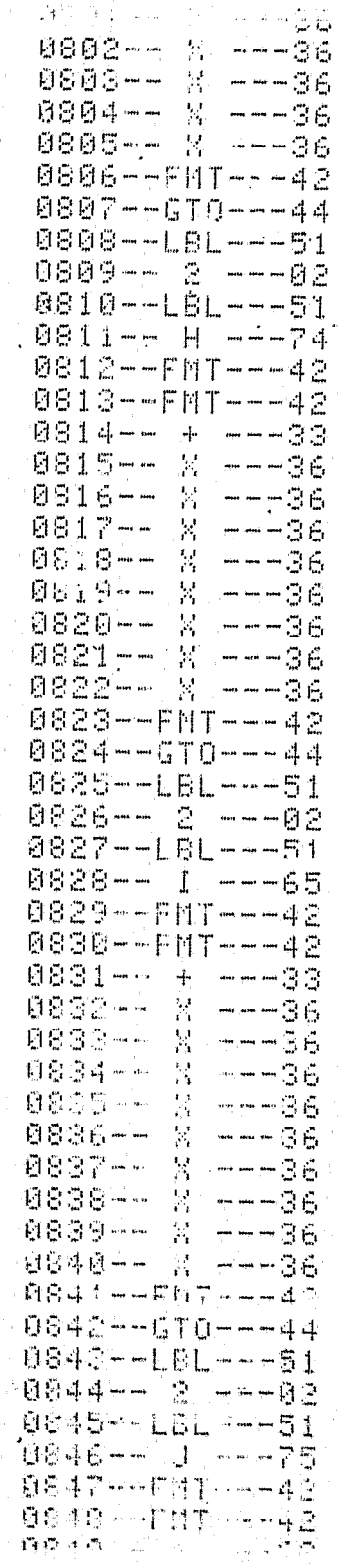
Program Listing of FRED (continued)

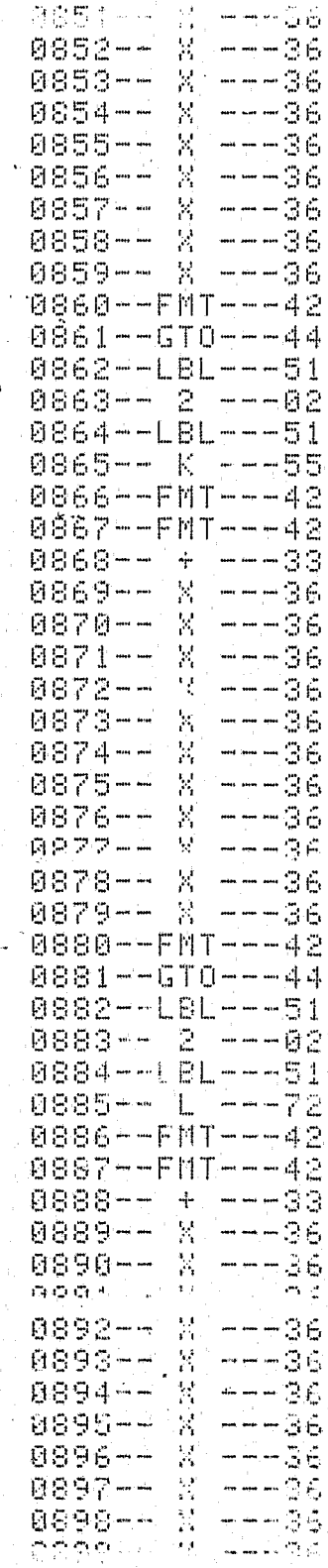
```
0601--  9  ---09
0602--  3  ---03
0603--X>Y---53
0604--  DN---25
0605--GTO---44
0606--LBL---51
0607--YTO---40
0608--  DN---25
0609--S/R---77
0610--LBL---51
0611--  B  ---66
0612--XFR---67
0613--IND---31
0614--  a  ---13
0615--  UP---27
0616--  b  ---14
0617--DIV---35
0618--  DN---25
0619--INT---64
0620--S/R---77
0621--LBL---51
0622--  X  ---36
0623--  UP---27
0624--  0  ---00
0625--X=Y---50
0626--GTO---44
0627--LBL---51
0628--  C  ---61
0629--CNT---47
0630--  1  ---01
0631--X=Y---50
0632--GTO---44
0633--LBL---51
0634--  A  ---62
0635--CNT---47
0636--  2  ---02
0637--X=Y---50
0638--GTO---44
0639--LBL---51
0640--  b  ---14
0641--CNT---47
0642--  3  ---03
0643--X=Y---50
0644--GTO---44
0645--LBL---51
0646--  C  ---61
0647--CNT---47
0648--  4  ---04
0649--X=Y---50
```

```
0650--GTO---44
0651--LBL---51
0652--  D  ---63
0653--CNT---47
0654--  5  ---05
0655--X=Y---50
0656--GTO---44
0657--LBL---51
0658--  E  ---60
0659--CNT---47
0660--  6  ---06
0661--X=Y---50
0662--GTO---44
0663--LBL---51
0664--  F  ---16
0665--CNT---47
0666--  7  ---07
0667--X=Y---50
0668--GTO---44
0669--LBL---51
0670--  G  ---15
0671--CNT---47
0672--  8  ---10
0673--X=Y---50
0674--GTO---44
0675--LBL---51
0676--  H  ---74
0677--CNT---47
0678--  9  ---11
0679--X=Y---50
0680--GTO---44
0681--LBL---51
0682--  I  ---65
0683--CNT---47
0684--  1  ---01
0685--  0  ---09
0686--X=Y---50
0687--GTO---44
0688--LBL---51
0689--  J  ---75
0690--CNT---47
0691--  1  ---01
0692--  1  ---01
0693--X=Y---50
0694--GTO---44
0695--LBL---51
0696--  K  ---55
0697--CNT---47
0698--  1  ---01
```

```
0700--  8  ---10
0701--LBL---51
0702--LBL---51
0703--  L  ---72
0704--CNT---47
0705--  1  ---01
0706--  3  ---03
0707--X=Y---50
0708--GTO---44
0709--LBL---51
0710--  M  ---70
0711--CNT---47
0712--  1  ---01
0713--  4  ---04
0714--X=Y---50
0715--GTO---44
0716--LBL---51
0717--  N  ---73
0718--CNT---47
0719--LBL---51
0720--  A  ---62
0721--FMT---42
0722--FMT---42
0723--  +  ---33
0724--  X  ---36
0725--FMT---42
0726--GTO---44
0727--LBL---51
0728--  2  ---02
0729--LBL---51
0730--  b  ---14
0731--FMT---42
0732--FMT---42
0733--  +  ---33
0734--  X  ---36
0735--  X  ---36
0736--FMT---42
0737--GTO---44
0738--LBL---51
0739--  2  ---02
0740--LBL---51
0741--  C  ---61
0742--FMT---42
0743--FMT---42
0744--  +  ---33
0745--  X  ---36
0746--  X  ---36
0747--  X  ---36
0748--FMT---42
0749--GTO---44
```

Program Listing of FRED (continued)





PROGRAM LISTING OF FRED (continued)

```
0901--[illegible]---42
0902--GTO---44
0903--LBL---51
0904-- 2 ---02
0905--LBL---51
0906-- M ---70
0907--FMT---42
0908--FMT---42
0909-- + ---33
0910-- X ---36
0911-- X ---36
0912-- X ---36
0913-- X ---36
0914-- X ---36
0915-- X ---36
0916-- X ---35
0917-- X ---36
0918-- X ---36
0919-- X ---36
0920-- X ---36
0921-- X ---36
0922-- X ---36
0923--FMT---42
0924--GTO---44
0925--LBL---51
0926-- 2 ---02
0927--LBL---51
0928-- [illegible] ---73
0929--FMT---42
0930--FMT---42
0931-- + ---33
0932-- X ---36
0933-- X ---36
0934-- X ---36
0935-- X ---36
0936-- X ---36
0937-- X ---36
0938-- X ---36
0939-- X ---36
0940-- X ---36
0941-- X ---36
0942-- X ---36
0943-- X ---36
0944-- X ---36
0945-- X ---36
0946--FMT---42
0947--GTO---44
0948--LBL---51
0949-- 2 ---02
0951-- [illegible] ---[illegible]
0952--FMT---42
0953--FMT---42
0954-- + ---33
0955--FMT---42
0956--GTO---44
0957--LBL---51
0958-- 2 ---02
0959--LBL---51
0960-- 8 ---10
0961--XFR---67
0962-- 1 ---01
0963-- 0 ---00
0964-- 8 ---10
0965-- UP---27
0966-- 2 ---02
0967-- - ---34
0968--YTO---40
0969-- 1 ---01
0970-- 0 ---00
0971-- 8 ---10
0972--FMT---42
0973--FMT---42
0974--CLR---20
0975--CLR---20
0976--CLR---20
0977--CLR---20
0978--CLR---20
0979--CLR---20
0980--CLR---20
0981--FMT---42
0982--END---46
```

```
STMT LEVEL NEST
  1          MAIN: PROCEDURE OPTIONS (MAIN);                                  A1000
                                                                              A1001
             /* FRAMINGHAM EDIT --- ERROR DETECTION PROGRAM */ /*BY R GOLDFRIED */ A1002
                                                                              A1003
  2     1    DECLARE CLUE0          CHARACTER (20) INITIAL ('ACCUMS START HERE'); A1009
             /* FILE DECLARATIONS */                                          A1010
  3     1      DECLARE FHTAPE FILE RECORD;                                    A1020
  4     1      DECLARE CARDIN FILE RECORD;                                    A1030
  5     1      DECLARE PRINTR FILE OUTPUT PRINT;                              A1040
  6     1      DECLARE PUNCHR FILE RECORD OUTPUT;                             A1050
                                                                              A1060
             /* ACCUMULATORS */                                               A1070
  7     1      DECLARE SUBJECTS_READ    DECIMAL FIXED (4,0) INITIAL (0);      A1080
  8     1      DECLARE TOTAL_ERRORS     DECIMAL FIXED (5,0) INITIAL (0);      A1090
                                                                              A1100
                                                                              A1110
             /* BUILTIN FUNCTIONS */                                          A1120
  9     1      DECLARE DATE             BUILTIN;                              A1130
 10     1      DECLARE LINENO           BUILTIN;                              A1140
                                                                              A1150
             /* INPUT RECORDS  */                                             A2010
 11     1    DECLARE CLUE1            CHARACTER (20) INITIAL ('INPUT RECS FOLLOW'); A2015
 12     1    DECLARE 1 FH_REC,                                                A2020
                    3 GIRL_NUM     PICTURE '999',                            A2030
                    3 CARD_NUM     PICTURE '99',                             A2040
                    3 DATA         CHARACTER (75);                           A2050
                                                                              A2060
 13     1    DECLARE 1 ARRAY_VALUES,                                          A2070
                    3 CODES        CHARACTER (3),                            A2080
                    3 CARD_NO      PICTURE '99',                             A2090
                    3 VALUES       CHARACTER (75);                           A2100
                                                                              A2110
                                                                              A2120
             /* OUTPUT RECORDS */                                             A2130
 14     1    DECLARE HEAD1          CHARACTER (15) INITIAL    ('FRAMINGHAM EDIT'); A2140
 15     1    DECLARE HEAD3          CHARACTER (80) INITIAL                    A2150
             ('GIRL #       CARD #       VARIABLE #       VALUE ON FILE      VALID A2160
              VALUES');                                                       A2170
 16     1    DECLARE FOOT1          CHARACTER (15) INITIAL    ('TOTAL SUBJECTS'); A2180
 17     1    DECLARE FOOT2          CHARACTER (15) INITIAL    ('TOTAL ERRORS'); A2190
 18     1    DECLARE EDIT_WORD      PICTURE 'ZZ,ZZ9';                         A2200
                                                                              A2210
 19     1    DECLARE 1 PUNCH_OUT,                                             A2220
                    3 GIRL_PNCH    CHARACTER (3),                            A2230
                    3 CARD_PNCH    CHARACTER (2),                            A2240
                    3 VAR_PNCH     CHARACTER (3),                            A2250
                    3 VAL_PNCH     CHARACTER (2),                            A2260
                    3 SPACE_PNCH   CHARACTER (70);                           A2270
                                                                              A2280
             /* HOLD AREAS */                                                 A3010
 20     1    DECLARE CLUE2          CHARACTER (15) INITIAL ('HOLDS FOLLOW'); A3015
```

PROGRAM LISTING OF

FHEDIT

(See page 1 of Data Center Programs)

```
STMT LEVEL NEST

                                                                                 A3020
  21     1          DECLARE PREV_GIRL          PICTURE '999'  INITIAL (0);       A3030
  22     1          DECLARE PREV_CARD          PICTURE '99'   INITIAL (0);       A3040
  23     1          DECLARE HOLD_CODE          CHARACTER (3);                    A3050
  24     1          DECLARE CARD_PRT           CHARACTER (2);                    A3060
  25     1          DECLARE PAGE_NO            DECIMAL FIXED (3,0) INITIAL (0);  A3065
  26     1          DECLARE RUN_DATE           CHARACTER (8);                    A3
                                                                                 A3070
                    /* INDICES */                                                A3080
                                                                                 A3090
  27     1          DECLARE CLUE3              CHARACTER (15) INITIAL ('INDICES NEXT');  A3095
  28     1          DECLARE I                  FIXED BINARY (15,0);              A3100
  29     1          DECLARE L                  FIXED BINARY (15,0);              A3110
  30     1          DECLARE M                  FIXED BINARY (15,0);              A3120
  31     1          DECLARE EOCARD             FIXED BINARY (15,0) INITIAL (0);
  32     1          DECLARE C             DECIMAL FIXED (4,0);                   A3130
  33     1          DECLARE J                  FIXED BINARY (15,0);              A3131
                                                                                 A3132
                    /* ARRAYS   */                                               A3140
  34     1          DECLARE CLUE4              CHARACTER (15) INITIAL ('ARRAYS START');  A3155
                                                                                 A3150
  35     1          DECLARE INPUT_VARS (835)      CHARACTER (4);                 A3160
  36     1          DECLARE INPUT_VAR (835)       CHARACTER (4)  DEFINED INPUT_VARS;  A3165
  37     1          DECLARE MINIMUM (835)         PICTURE 'R999';                A3170
  38     1          DECLARE MAXIMUM (835)         PICTURE 'R999';                A3180
  39     1          DECLARE NEGATIVE (835)        CHARACTER (4);                 A3190
  40     1          DECLARE EXCEPTS (835)         PICTURE 'R999';                A3200
  41     1          DECLARE VARS_HOLDS (835)      PICTURE 'R999';                A3210
                                                                                 A3220
                                                                                 A3230
                                                                                 A3240
                                                                                 A3250
  42     1                   CALL INIT;                /* PAGE K1    */          B1013
  43     1                   ON ENDFILE (FHTAPE) CALL EOJ;     /* LAST PAGE  */  B1015
  45     1                   CALL FILL_RANGES;         /* THE MAINLINE SERVES TO CALL    */  B1020
  46     1          REPEAT:  CALL READ_FHTAPE;         /* THE PROCEDURES TO READ EACH    */  B1030
  47     1                   CALL CARD_1;              /* TAPE RECORD AND PUT VARIABLES */  B1040
  48     1                   CALL READ_FHTAPE;         /* IN THE PROPER POSITION IN AN   */  B1050
  49     1                   CALL CARD_2;              /* ARRAY                          */  B1060
  50     1                   CALL READ_FHTAPE;                                       B1070
  51     1                   CALL CARD_3;              /* READ_FHTAPE IS ON PAGE D2      */  B1080
  52     1                   CALL READ_FHTAPE;         /* CARD PROCEDURES PAGES H1 - H9 */  B1090
  53     1                   CALL CARD_4;                                            B1100
  54     1                   CALL READ_FHTAPE;                                       B1110
  55     1                   CALL CARD_5;                                            B1120
  56     1                   CALL READ_FHTAPE;                                       B1130
  57     1                   CALL CARD_6;                                            B1140
  58     1                   CALL READ_FHTAPE;                                       B1150
  59     1                   CALL CARD_7;                                            B1160
```

```
STMT LEVEL NEST
   60     1              CALL READ_FHTAPE;                                    B1170
   61     1              CALL CARD_8;                                         B1180
   62     1              CALL READ_FHTAPE;                                    B1190
   63     1              CALL CARD_9;                                         B1200
   64     1              CALL READ_FHTAPE;                                    B1210
   65     1              CALL CARD_10;                                        B1220
   66     1              CALL READ_FHTAPE;                                    B1230
   67     1              CALL CARD_11;                                        B1240
   68     1              CALL READ_FHTAPE;                                    B1250
   69     1              CALL CARD_12;                                        B2010
   70     1              CALL READ_FHTAPE;                                    B2020
   71     1              CALL CARD_13;                                        B2030
   72     1              CALL READ_FHTAPE;                                    B2040
   73     1              CALL CARD_14;                                        B2050
   74     1              CALL READ_FHTAPE;                                    B2060
   75     1              CALL CARD_15;                                        B2070
   76     1              CALL READ_FHTAPE;                                    B2080
   77     1              CALL CARD_16;                                        B2090
   78     1              CALL READ_FHTAPE;                                    B2100
   79     1              CALL CARD_17;                                        B2110
   80     1              CALL READ_FHTAPE;                                    B2120
   81     1              CALL CARD_18;                                        B2130
   82     1              CALL READ_FHTAPE;                                    B2140
   83     1              CALL CARD_19;                                        B2150
   84     1              CALL READ_FHTAPE;                                    B2160
   85     1              CALL CARD_20;                                        B2170
   86     1              CALL READ_FHTAPE;                                    B2180
   87     1              CALL CARD_21;                                        B2190
   88     1              CALL READ_FHTAPE;                                    B2200
   89     1              CALL CARD_22;                                        B2210
   90     1              CALL READ_FHTAPE;                                    B2220
   91     1              CALL CARD_23;                                        B2230
   92     1              CALL READ_FHTAPE;                                    B2240
   93     1              CALL CARD_24;                                        B2250
   94     1              CALL READ_FHTAPE;                                    B2260
   95     1              CALL CARD_25;                                        B2270
   96     1              CALL RANGE_CHECK;                                    B2280
   97     1              GO TO REPEAT;                                        B2290
                                                                             B2310
                                                                             B2320
   98     1      FILL_RANGES:  PROCEDURE;                                     C1010
                                                                             C1020
   99     2      RE_READ: CALL READ_CARD;          /* THIS PROCEDURE READS IN THE   */   C1030
  100     2               IF EOCARD = 1 THEN GO TO ENDCARD;
  102     2               CALL CARD_1;             /* MIN, MAX, NEGATIVE, AND EXCEP-*/   C1040
  103     2               CALL READ_CARD;          /* TION VALUES.  IT CALLS PROCED-*/   C1050
  104     2               CALL CARD_2;             /* URES TO PLACE THE VALUES IN AN*/   C1060
  105     2               CALL READ_CARD;          /* APPROPRIATE ARRAY             */   C1070
  106     2               CALL CARD_3;                                         C1080
```

```
STMT LEVEL NEST
  107     2                  CALL READ_CARD;          /* READ_CARD ON PAGE D1          */     C1090
  108     2                  CALL CARD_4;             /* CARD PROCEDURES PAGES H1 - H9*/     C1100
  109     2                  CALL READ_CARD;                                                  C1110
  110     2                  CALL CARD_5;                                                     C1120
  111     2                  CALL READ_CARD;                                                  C1130
  112     2                  CALL CARD_6;                                                     C1140
  113     2                  CALL READ_CARD;                                                  C1150
  114     2                  CALL CARD_7;                                                     C1160
  115     2                  CALL READ_CARD;                                                  C1170
  116     2                  CALL CARD_8;                                                     C1180
  117     2                  CALL READ_CARD;                                                  C1190
  118     2                  CALL CARD_9;                                                     C1200
  119     2                  CALL READ_CARD;                                                  C1210
  120     2                  CALL CARD_10;                                                    C1220
  121     2                  CALL READ_CARD;                                                  C1230
  122     2                  CALL CARD_11;                                                    C1240
  123     2                  CALL READ_CARD;                                                  C1250
  124     2                  CALL CARD_12;                                                    C1260
  125     2            CALL READ_CARD;                                                        C2010
  126     2            CALL CARD_13;                                                          C2020
  127     2            CALL READ_CARD;                                                        C2030
  128     2            CALL CARD_14;                                                          C2040
  129     2            CALL READ_CARD;                                                        C2050
  130     2            CALL CARD_15;                                                          C2060
  131     2            CALL READ_CARD;                                                        C2070
  132     2            CALL CARD_16;                                                          C2080
  133     2            CALL READ_CARD;                                                        C2090
  134     2            CALL CARD_17;                                                          C2100
  135     2            CALL READ_CARD;                                                        C2110
  136     2            CALL CARD_18;                                                          C2120
  137     2            CALL READ_CARD;                                                        C2130
  138     2            CALL CARD_19;                                                          C2140
  139     2            CALL READ_CARD;                                                        C2150
  140     2            CALL CARD_20;                                                          C2160
  141     2            CALL READ_CARD;                                                        C2170
  142     2            CALL CARD_21;                                                          C2180
  143     2            CALL READ_CARD;                                                        C2190
  144     2            CALL CARD_22;                                                          C2200
  145     2            CALL READ_CARD;                                                        C2210
  146     2            CALL CARD_23;                                                          C2220
  147     2            CALL READ_CARD;                                                        C2230
  148     2            CALL CARD_24;                                                          C2240
  149     2            CALL READ_CARD;                                                        C2250
  150     2            CALL CARD_25;                                                          C2260
  151     2                 IF HOLD_CODE = 'MIN'                                              C3010
  152     2                 THEN MINIMUM = INPUT_VARS;                                        C3020
  153     2                 ELSE IF HOLD_CODE = 'MAX'                                         C3030
  154     2                      THEN MAXIMUM = INPUT_VARS;                                   C3040
  155     2                      ELSE IF HOLD_CODE = 'NEG'                                    C3050
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STMT LEVEL NEST

 156     2                       THEN NEGATIVE = INPUT_VARS;                     C3060
 157     2                       ELSE IF HOLD_CODE = 'EXC'                       C3070
 158     2                            THEN EXCEPTS = INPUT_VARS;                 C3080
 159     2                            ELSE CALL INPUT_ERR;          /* PAGE K2 */ C3090
 160     2                 GO TO RE_READ;                                        C3100
 161     2        ENDCARD: DO I = 1 TO 835 BY 1;                                 C3101
 162     2    1            C = I;                                                C3101
 163     2    1            IF SUBSTR (C,6,2) = '01' | SUBSTR (C,6,2) = '51'      C3102
 164     2    1            THEN DO;                                              C3103
 165     2    2                 PUT FILE (PRINTR) EDIT ('INPUT ARRAYS VALUES')   C3103
                                           (PAGE,COLUMN(50),A(25));              C3104
 166     2    2                 PUT FILE (PRINTR) EDIT ('I','MINIMUM','MAXIMUM', C3105
                                'NEGATIVE','EXCEPTION')(SKIP(3),COLUMN(28),A(3), C3106
                                                               4(A(10)));        C3107
 167     2    2                 END;                                             C3107
 168     2    1            PUT FILE (PRINTR) EDIT (C,MINIMUM (I),MAXIMUM (I),    C3109
                           NEGATIVE (I),EXCEPTS (I)) (SKIP(1),COLUMN(23),5(A(10))); C3110
 169     2    1            END;                                                  C3111
 170     2                 CALL HEADING;                                         C3112
                                                                                 C3110
 171     2                 END FILL_RANGES;                                      C3120
                                                                                 C3130
                                                                                 C3140
 172     1        READ_CARD: PROCEDURE;                                          D1010
                                                                                 D1020
 173     2                 ON ENDFILE (CARDIN) GO TO CARDX;                      D1025
 175     2                 READ FILE (CARDIN) INTO (ARRAY_VALUES);               D1030
 176     2                 DATA = VALUES;                                        D1040
 177     2                 CARD_NUM = CARD_NO;                                   D1050
 178     2                 IF CARD_NUM = PREV_CARD + 1                           D1060
 179     2                 THEN GO TO STORE;                                     D1070
 180     2                 ELSE IF CODES = HOLD_CODE                             D1080
 181     2                      THEN CALL SEQ_ERR;                               D1090
 182     2                      ELSE IF (PREV_CARD = 25 & CARD_NUM = 01)         D1100
 183     2                           THEN GO TO STORE;                           D1110
 184     2                           ELSE CALL SEQ_ERR;           /* PAGE K2 */  D1120
 185     2        STORE:   PREV_CARD = CARD_NUM;                                 D1130
 186     2                 HOLD_CODE = CODES;                                    D1140
 187     2                 GO TO END_RD;                                         D1150
 188     2        CARDX:  EOCARD=1;
 189     2        END_RD: END READ_CARD;                                         D1160
                                                                                 D1170
 190     1        READ_FHTAPE: PROCEDURE;                                        D2010
                                                                                 D2020
 191     2                 READ FILE (FHTAPE) INTO (FH_REC);                     D2030
 192     2              IF GIRL_NUM > 15  THEN CALL EOJ;                         D2035
 194     2                 IF GIRL_NUM = PREV_GIRL                               D2040
 195     2                 THEN IF CARD_NUM = PREV_CARD + 1                      D2050
 196     2                      THEN GO TO READX;                                D2060
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STMT LEVEL NEST

197     2                       ELSE CALL SEQ_ERR;                                  D2070
19      2                   ELSE IF GIRL_NUM < PREV_GIRL                            D2080
19      2                       THEN CALL SEQ_ERR;              /*PAGE K2 */      D2090
20      2                       ELSE;                                               D2100
201     2                   IF PREV_CARD = 25 & CARD_NUM = 01                       D2110
20      2                   THEN DO;                                                D2120
20      2   1                   SUBJECTS_READ = SUBJECTS_READ + 1;                  D2123
20      2   1                   GO TO READX;                                        D2125
20      2   1                   END;                                                D2127
20      2                   ELSE CALL SEQ_ERR;                                      D2130
20      2               READX: PREV_GIRL = GIRL_NUM;                                D2140
20      2                   PREV_CARD = CARD_NUM;                                   D2150
                                                                                    D2160
20      2                   END READ_FHTAPE;                                        D2170
                                                                                    D2180
                                                                                    D2190
21      1           RANGE_CHECK: PROCEDURE;                                         E1010
                                                                                    E1020
211     2                   DO I = 1 TO 835 BY 1;                                   E1030
212     2   1               IF SUBSTR (INPUT_VARS (I),1,1) = '-'                    E1040
213     2   1               THEN DO;                                                E1041
214     2   2                   CALL NEG_CHECK;                                     E1043
215     2   2                   GO TO VAR_OK;                                       E1045
216     2   2                   END;                                                E1047
217     2   1               IF SUBSTR (INPUT_VARS (I),2,1) = '-' |                  E1050
                               SUBSTR (INPUT_VARS (I),3,1) = '-' |                  E1051
                               SUBSTR (INPUT_VARS (I),4,1) = '-' |                  E1052
                               SUBSTR (INPUT_VARS (I),1,1) < '0' |                  E1053
                               SUBSTR (INPUT_VARS (I),2,1) < '0' |                  E1054
                               SUBSTR (INPUT_VARS (I),3,1) < '0' |                  E1055
                               SUBSTR (INPUT_VARS (I),4,1) < '0'                    E1056
218     2   1               THEN GO TO VAR_NOK;                                     E1057
219     2   1               ELSE VARS_HOLDS (I) = INPUT_VARS (I);                   E1060
220     2   1               IF VARS_HOLDS (I) = EXCEPTS (I)                         E1070
221     2   1               THEN GO TO VAR_OK;                                      E1075
222     2   1               IF VARS_HOLDS (I) ¬< MINIMUM (I) &                      E1080
                               VARS_HOLDS (I) ¬> MAXIMUM (I)                        E1090
223     2   1               THEN GO TO VAR_OK;                                      E1100
224     2   1   VAR_NOK:  CALL ERR_FOUND;                    /* PAGE F1 */      E1110
225     2   1   VAR_OK:   END;                                                      E1120
                                                                                    E1130
226     2                   END RANGE_CHECK;                                        E1140
                                                                                    E1150
227     1           NEG_CHECK: PROCEDURE;                                           E1160
228     2                   IF NEGATIVE (I) = '-500'                                E1170
229     2                   THEN IF INPUT_VARS (I) = '-100' | INPUT_VARS (I) = '-200'  E1180
230     2                       THEN GO TO END_CK;                                  E1190
231     2                       ELSE GO TO CALL_ERR;                                E1200
232     2                   IF NEGATIVE (I) = '-600'                                E1210
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STMT LEVEL NEST
  233     2                 THEN IF INPUT_VARS (I) = '-200' | INPUT_VARS (I) = '-300'        E1220
  234     2                      THEN GO TO END_CK;                                          E1230
  235     2                      ELSE GO TO CALL_ERR;                                        E1240
  236     2                 IF NEGATIVE (I) = '-700'                                         E1250
  237     2                 THEN IF INPUT_VARS (I) = '-100' | INPUT_VARS (I) = '-200' |      E2010
                                INPUT_VARS (I) = '-300'                                    E2020
  238     2                      THEN GO TO END_CK;                                          E2030
  239     2                      ELSE GO TO CALL_ERR;                                        E2040
  240     2                 IF NEGATIVE (I) = '-800'                                         E2050
  241     2                 THEN IF INPUT_VARS (I) = '-100' | INPUT_VARS (I) = '-300'        E2060
  242     2                      THEN GO TO END_CK;                                          E2070
  243     2                      ELSE GO TO CALL_ERR;                                        E2080
  244     2                 IF NEGATIVE (I) = '-900'                                         E2090
  245     2                 THEN IF INPUT_VARS (I) = '-100' | INPUT_VARS (I) = '-200' |      E2100
                                INPUT_VARS (I) = '-400'                                    E2110
  246     2                      THEN GO TO END_CK;                                          E2120
  247     2                      ELSE GO TO CALL_ERR;                                        E2130
  248     2                 IF INPUT_VARS (I) = NEGATIVE (I)                                 E2140
  249     2                 THEN GO TO END_CK;                                               E2150
  250     2           CALL_ERR: CALL ERR_FOUND;                    /* PAGE F1 */           E2160
  251     2           END_CK:  END NEG_CHECK;                                               E2170
                                                                                           E2180
  252     1           ERR_FOUND: PROCEDURE;                                                F1010
                                                                                           F1013
                                                  /* PRINT & PUNCH ERRORS  */              F1015
  253     2                 CALL SEEK_CARD;                                                F1020
  254     2                 IF LINENO (PRINTR) > 58 THEN CALL HEADING;                     F1025
  256     2                 C = I;                                                         F1026
  257     2                 PUT FILE (PRINTR) EDIT (PREV_GIRL,CARD_PRT,C,INPUT_VARS (I),   F1030
                                MINIMUM (I), ',',MAXIMUM (I),',',NEGATIVE (I),',',       F1040
                                EXCEPTS (I))                                             F1050
                                (SKIP(2),COLUMN(20),A(3),X(10),A(2),X(10),A(8),          F1060
                                X(10),A(4),X(10),A(4),A(1),A(4),A(1),A(4),A(1),          F1070
                                A(4));                                                   F1080
  258     2                 TOTAL_ERRORS = TOTAL_ERRORS + 1;                               F1090
                                                                                           F1100
  259     2                 GIRL_PNCH = PREV_GIRL;                                         F1110
  260     2                 CARD_PNCH = CARD_PRT;                                          F1120
  261     2                 VAR_PNCH  = SUBSTR (C,5,3);                                    F1130
  262     2                 VAL_PNCH  = '  ';                                              F1140
  263     2                 SPACE_PNCH = (70)' ';                                          F1150
  264     2                 WRITE FILE (PUNCHR) FROM (PUNCH_OUT);                          F1160
                                                                                           F1170
  265     2                 END ERR_FOUND;                                                 F1180
                                                                                           F1190
  266     1           SEEK_CARD: PROCEDURE;                                                F1200
                                                  /* FIND CARD # OF ERROR  */              F1205
  267     2                 IF I < 34 THEN DO; CARD_PRT = '01';GO TO SEEK_END;END;         F1210
  272     2                 IF I < 69 THEN DO; CARD_PRT = '02';GO TO SEEK_END;END;         F1220
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STMT LEVEL NEST
277     2               IF I < 101 THEN DO; CARD_PRT = '03';GO TO SEEK_END;END;          F1230
282     2               IF I < 136 THEN DO; CARD_PRT = '04';GO TO SEEK_END;END;          F1240
287     2               IF I < 172 THEN DO; CARD_PRT = '05';GO TO SEEK_END;END;          F1250
292     2               IF I < 209 THEN DO; CARD_PRT = '06';GO TO SEEK_END;END;          F1260
297     2               IF I < 242 THEN DO; CARD_PRT = '07'; GO TO SEEK_END; END;        F2010
302     2               IF I < 274 THEN DO; CARD_PRT = '08'; GO TO SEEK_END; END;        F2020
307     2               IF I < 308 THEN DO; CARD_PRT = '09'; GO TO SEEK_END; END;        F2030
312     2               IF I < 345 THEN DO; CARD_PRT = '10'; GO TO SEEK_END; END;        F2040
317     2               IF I < 372 THEN DO; CARD_PRT = '11'; GO TO SEEK_END; END;        F2050
322     2               IF I < 408 THEN DO; CARD_PRT = '12'; GO TO SEEK_END; END;        F2060
327     2               IF I < 442 THEN DO; CARD_PRT = '13'; GO TO SEEK_END; END;        F2070
332     2               IF I < 471 THEN DO; CARD_PRT = '14'; GO TO SEEK_END; END;        F2080
337     2               IF I < 506 THEN DO; CARD_PRT = '15'; GO TO SEEK_END; END;        F2090
342     2               IF I < 539 THEN DO; CARD_PRT = '16'; GO TO SEEK_END; END;        F2100
347     2               IF I < 571 THEN DO; CARD_PRT = '17'; GO TO SEEK_END; END;        F2110
352     2               IF I < 606 THEN DO; CARD_PRT = '18'; GO TO SEEK_END; END;        F2120
357     2               IF I < 640 THEN DO; CARD_PRT = '19'; GO TO SEEK_END; END;        F2130
362     2               IF I < 672 THEN DO; CARD_PRT = '20'; GO TO SEEK_END; END;        F2140
367     2               IF I < 706 THEN DO; CARD_PRT = '21'; GO TO SEEK_END; END;        F2150
372     2               IF I < 740 THEN DO; CARD_PRT = '22'; GO TO SEEK_END; END;        F2160
377     2               IF I < 774 THEN DO; CARD_PRT = '23'; GO TO SEEK_END; END;        F2170
382     2               IF I < 802 THEN DO; CARD_PRT = '24'; GO TO SEEK_END; END;        F2180
387     2               IF I < 836 THEN DO; CARD_PRT = '25'; GO TO SEEK_END; END;        F2190
392     2               CALL INPUT_ERR;                 /* PAGE K2 */                    F2200
                                                                                         F2210
396     2       SEEK_END: END SEEK_CARD;                                                 F2220
                                                                                         F2230
                                                                                         F2240
                                                                                         F2250
394     1       CARD_1:  PROCEDURE;                                                      H1010
                                                  /* THE NEXT 25 PROCEDURES   */         H1015
395     2                INPUT_VARS (1) = '-001';  /*FILL THE INPUT ARRAY ACCORDING*/    H1020
396     2                I = 1;                   /* TO THE CARD NUMBER FORMAT OF  */    H1030
397     2                L = 10;                  /* THE LAST RECORD READ          */    H1040
398     2                M = 72;                                                         H1050
399     2                CALL FILL_INPUT;         /* FILL_INPUT PROCEDURE PAGE J1  */    H1060
                                                                                         H1070
400     2                END CARD_1;                                                     H1080
                                                                                         H1090
401     1       CARD_2:  PROCEDURE;                                                      H1100
402     2                I = 33;                                                         H1110
403     2                L = 6;                                                          H1120
404     2                M = 74;                                                         H1130
405     2                CALL FILL_INPUT;                                                H1140
                                                                                         H1150
406     2                END CARD_2;                                                     H1160
                                                                                         H1170
407     1       CARD_3:  PROCEDURE;                                                      H1180
408     2                I = 68;                                                         H1190
```

```
STMT LEVEL NEST

 409     2                   L = 6;                                    H1200
 410     2                   M = 12;                                   H1210
 411     2                   CALL FILL_INPUT;                          H1220
 412     2                   I = 72;                                   H1230
 413     2                   DO J = 14 TO 41 BY 3;                     H1240
 414     2     1             I = I + 1;                                H1250
 415     2     1             INPUT_VAR (I) = SUBSTR (DATA,J-5,3) || '0';  H1260
 416     2     1             END;                                      H1270
 417     2                   I = 82;                                   H2010
 418     2                   L = 44;                                   H2020
 419     2                   M = 78;                                   H2030
 420     2                   CALL FILL_INPUT;                          H2040
                                                                       H2050
 421     2                   END CARD_3;                               H2060
                                                                       H2070
 422     1          CARD_4:  PROCEDURE;                                H2080
 423     2                   I = 100;                                  H2090
 424     2                   L = 6;                                    H2100
 425     2                   M = 10;                                   H2110
 426     2                   CALL FILL_INPUT;                          H2120
 427     2                   INPUT_VAR (104) = SUBSTR (DATA,7,4);      H2130
 428     2                   INPUT_VAR (105) = SUBSTR (DATA,11,4);     H2140
 429     2                   I = 105;                                  H2150
 430     2                   L = 20;                                   H2160
 431     2                   M = 78;                                   H2170
 432     2                   CALL FILL_INPUT;                          H2180
                                                                       H2190
 433     2                   END CARD_4;                               H2200
                                                                       H2210
 434     1          CARD_5:  PROCEDURE;                                H2220
 435     2                   I = 135;                                  H2230
 436     2                   L = 6;                                    H2240
 437     2                   M = 76;                                   H2250
 438     2                   CALL FILL_INPUT;                          H2260
                                                                       H2270
 439     2                   END CARD_5;                               H2280
 440     1          CARD_6:  PROCEDURE;                                H3010
 441     2                   I = 171;                                  H3020
 442     2                   L = 6;                                    H3030
 443     2                   M = 78;                                   H3040
 444     2                   CALL FILL_INPUT;                          H3050
                                                                       H3060
 445     2                   END CARD_6;                               H3070
                                                                       H3080
 446     1          CARD_7:  PROCEDURE;                                H3090
 447     2                   I = 208;                                  H3100
 448     2                   L = 6;                                    H3110
 449     2                   M = 70;                                   H3120
 450     2                   CALL FILL_INPUT;                          H3130
```

```
STMT LEVEL NEST
                                                                     H3140
 451     2                 END CARD_7;                               H3150
                                                                     H3160
 452     1       CARD_8:  PROCEDURE;                                 H3170
 453     2                 I = 241;                                  H3180
 454     2                 L = 6;                                    H3190
 455     2                 M = 68;                                   H3200
 456     2                 CALL FILL_INPUT;                          H3210
                                                                     H3220
 457     2                 END CARD_8;                               H3230
                                                                     H3240
                                                                     H3250
 458     1       CARD_9:  PROCEDURE;                                 H4010
 459     2                 I = 273;                                  H4020
 460     2                 L = 6;                                    H4030
 461     2                 M = 72;                                   H4040
 462     2                 CALL FILL_INPUT;                          H4050
                                                                     H4060
 463     2                 END CARD_9;                               H4070
                                                                     H4080
 464     1       CARD_10: PROCEDURE;                                 H4090
 465     2                 I = 307;                                  H4100
 466     2                 L = 6;                                    H4110
 467     2                 M = 78;                                   H4120
 468     2                 CALL FILL_INPUT;                          H4130
                                                                     H4140
 469     2                 END CARD_10;                              H4150
                                                                     H4160
 470     1       CARD_11: PROCEDURE;                                 H4170
 471     2                 I = 344;                                  H4180
 472     2                 L = 6;                                    H4190
 473     2                 M = 42;                                   H4200
 474     2                 CALL FILL_INPUT;                          H4210
 475     2                 INPUT_VAR (364) = SUBSTR (DATA,39,3)    || '0';  H4220
 476     2                 I = 364;                                  H4230
 477     2                 L = 47;                                   H4240
 478     2                 M = 59;                                   H4250
 479     2                 CALL FILL_INPUT;                          H4260
                                                                     H4270
 480     2                 END CARD_11;                              H4280
 481     1       CARD_12: PROCEDURE;                                 H5010
 482     2                 I = 371;                                  H5020
 483     2                 L = 6;                                    H5030
 484     2                 M = 76;                                   H5040
 485     2                 CALL FILL_INPUT;                          H5050
                                                                     H5060
 486     2                 END CARD_12;                              H5070
                                                                     H5080
 487     1       CARD_13: PROCEDURE;                                 H5090
```

CONTINUED

2 OF 4

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STMT LEVEL NEST

488    2                    I = 407;                                          H5100
489    2                    L = 6;                                            H5110
490    2                    M = 72;                                           H5120
491    2                    CALL FILL_INPUT;                                  H5130
                                                                              H5140
492    2                    END CARD_13;                                      H5150
                                                                              H5160
493    1           CARD_14: PROCEDURE;                                        H5170
494    2                    I = 441;                                          H5180
495    2                    L = 6;                                            H5190
496    2                    M = 62;                                           H5200
497    2                    CALL FILL_INPUT;                                  H5210
                                                                              H5220
498    2                    END CARD_14;                                      H5230
                                                                              H5240
                                                                              H5250
499    1           CARD_15: PROCEDURE;                                        H6010
500    2                    I = 470;                                          H6020
501    2                    L = 6;                                            H6030
502    2                    M = 18;                                           H6040
503    2                    CALL FILL_INPUT;                                  H6050
504    2                    INPUT_VAR (478) = SUBSTR (DATA,15,3)  || '0';     H6060
505    2                    INPUT_VAR (479) = SUBSTR (DATA,18,1)  || '000';   H6070
506    2                    INPUT_VAR (480) = SUBSTR (DATA,19,2)  || '00';
507    2                    INPUT_VAR (481) = SUBSTR (DATA,21,3)  || '0';     H6090
508    2                    INPUT_VAR (482) = SUBSTR (DATA,24,3)  || '0';     H6100
509    2                    I = 482;                                          H6110
510    2                    L = 32;                                           H6120
511    2                    M = 76;                                           H6130
512    2                    CALL FILL_INPUT;                                  H6140
                                                                              H6150
513    2                    END CARD_15;                                      H6160
                                                                              H6170
514    1           CARD_16: PROCEDURE;                                        H6180
515    2                    I = 505;                                          H6190
516    2                    L = 6;                                            H6200
517    2                    M = 70;                                           H6210
518    2                    CALL FILL_INPUT;                                  H6220
                                                                              H6230
519    2                    END CARD_16;                                      H6240
                                                                              H6250
520    1           CARD_17: PROCEDURE;                                        H7010
521    2                    I = 538;                                          H7020
522    2                    L = 6;                                            H7030
523    2                    M = 68;                                           H7040
524    2                    CALL FILL_INPUT;                                  H7050
                                                                              H7060
525    2                    END CARD_17;                                      H7070
                                                                              H7080
```

```
STMT LEVEL NEST

 526    1           CARD_18: PROCEDURE;
 527    2                    I = 570;
 528    2                    L = 6;
 529    2                    M = 74;
 530    2                    CALL FILL_INPUT;

 531    2                    END CARD_18;

 532    1           CARD_19: PROCEDURE;
 533    2                    I = 605;
 534    2                    L = 6;
 535    2                    M = 72;
 536    2                    CALL FILL_INPUT;

 537    2                    END CARD_19;

 538    1           CARD_20: PROCEDURE;
 539    2                    I = 639;
 540    2                    L = 6;
 541    2                    M = 68;
 542    2                    CALL FILL_INPUT;

 543    2                    END CARD_20;

 544    1           CARD_21: PROCEDURE;
 545    2                    I = 671;
 546    2                    L = 6;
 547    2                    M = 72;
 548    2                    CALL FILL_INPUT;

 549    2                    END CARD_21;

 550    1           CARD_22: PROCEDURE;
 551    2                    I = 705;
 552    2                    L = 6;
 553    2                    M = 72;
 554    2                    CALL FILL_INPUT;

 555    2                    END CARD_22;

 556    1           CARD_23: PROCEDURE;
 557    2                    I = 739;
 558    2                    L = 6;
 559    2                    M = 12;
 560    2                    CALL FILL_INPUT;
 561    2                    I = 743;
 562    2                    DO L = 14,19,24,29,34,39;
 563    2     1              I = I + 1;
 564    2     1              INPUT_VAR (I) = SUBSTR (DATA,L-5,3) || '0';
```

```
STMT LEVEL NEST

565    2   1           I = I + 1;                                                    H9100
566    2   1           INPUT_VAR (I) = SUBSTR (DATA,L-2,2)   || '00';                H9110
567    2   1           END;                                                          H9120
568    2               I = 755;                                                      H9130
569    2               L = 44;                                                       H9140
570    2               M = 78;                                                       H9150
571    2               CALL FILL_INPUT;                                              H9160
                                                                                     H9170
572    2               END CARD_23;                                                  H9180
                                                                                     H9190
573    1      CARD_24: PROCEDURE;                                                    H9200
574    2               I = 773;                                                      H9210
575    2               L = 6;                                                        H9220
576    2               M = 60;                                                       H9230
577    2               CALL FILL_INPUT;                                              H9240
                                                                                     H9250
578    2               END CARD_24;                                                  H9260
                                                                                     H9270
579    1      CARD_25: PROCEDURE;                                                    H9280
580    2               I = 801;                                                      H9290
581    2               L = 6;                                                        H9300
582    2               M = 72;                                                       H9310
583    2               CALL FILL_INPUT;                                              H9320
                                                                                     H9330
584    2              IF SUBSTR (DATA,69,2) ¬= '  ' THEN DO;                         H9331
586    2   1                    PUT FILE (PRINTR) EDIT (GIRL_NUM,CARD_NUM,'836',     H9333
                                SUBSTR (DATA,69,2)) (SKIP(2),COLUMN(20),A(13),A(12), H9334
587    2   1                    A(18),A(14));          END;                          H9335
588    2               END CARD_25;                                                  H9340
                                                                                     H9350
589    1      FILL_INPUT: PROCEDURE;                                                 J1180
                                            /* MOVES PARTS OF INPUT RECORDS  */      J1185
590    2               DO J = L TO M BY 2;  /* TO THE INPUT_VAR ARRAY        */      J1190
591    2   1           I = I + 1;                                                    J1200
592    2   1           INPUT_VAR (I) = SUBSTR (DATA,J-5,2) || '00';                  J1210
593    2   1           END;                                                          J1220
                                                                                     J1230
594    2               END FILL_INPUT;                                               J1240
                                                                                     J1250
595    1      INIT:    PROCEDURE;                                                    K1010
                                                                                     K1020
596    2               OPEN FILE (FHTAPE),                                           K1030
                            FILE (CARDIN),                                           K1040
                            FILE (PRINTR),                                           K1050
                            FILE (PUNCHR);                                           K1060
597    2               RUN_DATE = SUBSTR (DATE,3,2) || '/' || SUBSTR (DATE,5,2)      K1070
                             || '/' || SUBSTR (DATE,1,2);                            K1080
598    2                    PUT FILE (PRINTR) EDIT ('INPUT ARRAYS VALUES')           K1090
                                              (PAGE,COLUMN(50),A(25));               K1100
```

```
STMT LEVEL NEST
599    2                PUT FILE (PRINTR) EDIT ('1','MINIMUM','MAXIMUM',          K1101
                        'NEGATIVE','EXCEPTION')(SKIP(3),COLUMN(28),A(3),          K1102
                                                          4(A(10)));              K1103
                                                                                  K1100
600    2              END INIT;                                                   K1110
                                                                                  K1120
601    1      HEADING: PROCEDURE;                                                K1130
                                                                                  K1140
602    2              PUT FILE (PRINTR) EDIT (HEAD1)                             K1150
                                             (PAGE,COLUMN(51),A(15));             K1160
603    2              PAGE_NO = PAGE_NO + 1;                                     K1170
604    2              EDIT_WORD = PAGE_NO;                                       K1180
605    2              PUT FILE (PRINTR) EDIT ('DATE RUN ',RUN_DATE,'PAGE ',      K1190
                                              EDIT_WORD)                          K1200
                                             (SKIP(2),COLUMN(17),A(9),A(8),      K1210
                                              COLUMN(88),A(5),A(6));             K1220
606    2              PUT FILE (PRINTR) EDIT (HEAD3)                             K1230
                                             (SKIP(2),COLUMN(19),A(80));          K1240
                                                                                  K1250
607    2              END HEADING;                                               K1260
608    1      INPUT_ERR: PROCEDURE;                                              K2010
                                                                                  K2020
609    2              PUT FILE (PRINTR) EDIT ('PROCESSING TERMINATED DUE TO',    K2030
                                              ' INPUT CARD ERROR')                K2040
                                             (PAGE,COLUMN(30),A(50));             K2050
610    2              PUT FILE (PRINTR) EDIT ('LAST INPUT CARD WAS:',ARRAY_VALUES) K2060
                                             (SKIP(2),COLUMN(30),A(25),A(80));    K2070
611    2              CALL EOJ;                                                  K2080
                                                                                  K2090
612    2              END INPUT_ERR;                                             K2100
                                                                                  K2110
613    1      SEQ_ERR: PROCEDURE;                                                K2120
                                                                                  K2130
614    2              PUT FILE (PRINTR) EDIT ('PROCESSING TERMINATED DUE TO',    K2140
                                              ' SEQUENCE ERROR')                  K2150
                                             (PAGE,COLUMN(30),A(50));             K2160
615    2              PUT FILE (PRINTR) EDIT ('LAST REC READ WAS:',FH_REC)       K2170
                                             (SKIP(2),COLUMN(30),A(25),A(80));    K2180
616    2              PUT FILE (PRINTR) EDIT ('PREVIOUS GIRL # AND CARD # ARE:', K2190
                                              PREV_GIRL,PREV_CARD)                K2200
                                             (SKIP(2),COLUMN(30),A(33),A(5),A(3)); K2210
617    2              CALL EOJ;                                                  K2220
                                                                                  K2230
618    2              END SEQ_ERR;                                               K2240
                                                                                  K2250
619    1      EOJ: PROCEDURE;                                                    Z1010
                                                                                  Z1020
620    2              EDIT_WORD = SUBJECTS_READ;                                 Z1030
621    2              PUT FILE (PRINTR) EDIT (FOOT1,EDIT_WORD)                   Z1040
```

```
STMT LEVEL NEST
                                        (SKIP(3),COLUMN(47),A(15),A(6));          Z1050
622     2               EDIT_WORD = TOTAL_ERRORS;                                 Z1060
623     2               PUT FILE (PRINTR) EDIT (FOOT2,EDIT_WORD)                  Z1070
                                        (SKIP(2),COLUMN(47),A(15),A(6));          Z1080
624     2               CLOSE FILE (FHTAPE),                                      Z1090
                              FILE (CARDIN),                                      Z1100
                              FILE (PRINTR),                                      Z1110
                              FILE (PUNCHR);                                      Z1120
                                                                                  Z1130
625     1               GO TO STOP_RUN;                                           Z1140
                                                                                  Z1150
626     1               END EOJ;                                                  Z1160
                                                                                  Z1170
627     1       STOP_RUN: END MAIN;                                               Z1180
```

PROGRAM LISTING OF

MBI 1

(See page 2 of Data Center Programs)

```
NUMBERED        YES                                                              00000
RUN NAME        MBI FINGERPRINTS                                                 01010
FILE NAME       MBIFP                                                            01020
VARIABLE LIST   IDNO,CARDNO,RCREL,SEX,RACE,GCDER,RR1,RU1,RPAT1,RTYP1,           01030
                LR1,LU1,LPAT1,LTYP1,RR2,RU2,RPAT2,RTYP2,LR2,LU2,LPAT2,           01040
                LTYP2,RR3,RU3,RPAT3,RTYP3,LR3,LU3,LPAT3,LTYP3,RR4,RU4,           01050
                RPAT4,RTYP4,LR4,LU4,LPAT4,LTYP4,RR5,RU5,RPAT5,RTYP5,             01060
                LR5,LU5,LPAT5,LTYP5                                              01065
INPUT FORMAT    FIXED (F7.0,F2.0,F2.0,F1.0,F1.0,F1.0,F2.0,F2.0,F2.0,             01070
                F1.0,F2.0,F2.0,F2.0,F1.0,F2.0,F2.0,F2.0,F1.0,F2.0,F2.0,          01080
                F2.0,F1.0,F2.0,F2.0,F2.0,F1.0,F2.0,F2.0,F2.0,F1.0,F2.0,          01090
                F2.0,F2.0,F1.0,F2.0,F2.0,F2.0,F1.0,F2.0,F2.0,F2.0,F1.0,          01100
                F2.0,F2.0,F2.0,F1.0)                                             01105

IGNORING INDEFINITE REPETITION, THE INPUT FORMAT PROVIDES FOR  46 VARIABLES.   46 WILL BE READ.
IT PROVIDES FOR  1 RECORDS ('CARDS') PER CASE.  A MAXIMUM OF   84 'COLUMNS' ARE USED ON A RECORD.

SUBFILE LIST    WHITE,BLACK,OTHER                                                01160
# OF CASES      780,220,14
INPUT MEDIUM    TAPE                                                             01120
VALUE LABEL     RTYP1,LTYP1,RTYP2,LTYP2,RTYP3,LTYP3,RTYP4,LTYP4,RTYP5,           01130
                LTYP5 (0) PLAIN ARCH (1) TENTED ARCH (2) CONCENTRIC              01140
                WHORL (3) SPIRAL WHORL (4) DOUBLE LOOP (5) ULNAR LOOP            01150
                (6) RADIAL LOOP (7) CENTRAL POCKET (8) ACCIDENTAL                01160
                (9) NO INFO OR AMPUT                                             01170
VALUE LABEL     RPAT1,RPAT2,RPAT3,RPAT4,RPAT5,LPAT1,LPAT2,LPAT3,LPAT4,           01171
                LPAT5 (01) OKROS ARCH (02) OKROS ARCH (05) OKROS ARCH            01172
                (07) OKROS TENTED ARCH (08) OKROS TENTED ARCH                    01173
                (09) OKROS TENTED ARCH (04) OKROS RAD LOOP (14) OKROS            01174
                RAD LOOP (15) OKROS RAD LOOP (16) OKROS RAD LOOP                 01175
                (22) OKROS RAD LOOP (23) OKROS RAD LOOP (24) OKROS RAD           01176
                LOOP (30) OKROS RAD LOOP (31) OKROS RAD LOOP (32) OKROS          01177
                RAD LOOP (33) OKROS RAD LOOP (03) OKROS ULN LOOP                 01178
                (10) OKROS ULN LOOP (11) OKROS ULN LOOP (12) OKROS ULN           01179
                LOOP (18) OKROS ULN LOOP (19) OKROS ULN LOOP (20) OKROS          0117A
                ULN LOOP (26) OKROS ULN LOOP (27) OKROS ULN LOOP                 01178
                (28) OKROS ULN LOOP (29) OKROS ULN LOOP (00) OKROS CONC          0117C
                WRL (50) OKROS CONC WRL (52) OKROS CONC WRL (56) OKROS           0117D
                CONC WRL (57) OKROS CONC WRL (58) OKROS CONC WRL                 0117E
                (59) OKROS CONC WRL (46) OKROS SPRL WRL (47) OKROS SPRL          0117F
                WRL (48) OKROS SPRL WRL (49) OKROS SPRL WRL (34) OKROS           0117G
                DL (35) OKROS DL (36) OKROS DL (37) OKROS DL (38) OKROS          0117H
                DL (39) OKROS DL (40) OKROS DL (41) OKROS DL (42) OKROS          0117I
                DL (43) OKROS DL (44) OKROS DL (45) OKROS DL (51) OKROS          0117J
                DL (53) OKROS DL (13) OKROS CPL (17) OKROS CPL                   0117K
                (21) OKROS CPL (25) OKROS CPL (54) OKROS CPL (55) OKROS          0117L
                CPL (66) OKROS ACCIDENTAL (99) OKROS UNKNOWN                     0117M
PRINT FORMATS   IDNO TO LTYP5 (0)                                               01180
VAR LABELS      RR1,1ST RT RADIAL/RU1,1ST RT ULNAR/RTYP1,1ST RT PATTERN/         01190
                LR1,1ST LT RADIAL/LU1,1ST LT ULNAR/LTYP1 1ST LT PATTERN/         01200
                RR2,2ND RT RADIAL/RU2,2ND RT ULNAR/RTYP2,2ND RT PATTERN/         01210
                LR2,2ND LT RADIAL/LU2,2ND LT ULNAR/LTYP2,2ND LT PATTERN/         01220
                RR3,3RD RT RADIAL/RU3,3RD RT ULNAR/RTYP3,3RD RT PATTERN/         01230
                LR3,3RD LT RADIAL/LU3,3RD LT ULNAR/LTYP3,3RD LT PATTERN/         01240
```

```
                        RR4,4TH RT RADIAL/RU4,4TH RT ULNAR/RTYP4,4TH RT PATTERN/      01250
                        LR4,4TH LT RADIAL/LU4,4TH LT ULNAR/LTYP4,4TH LT PATTERN/      01260
                        RR5,5TH RT RADIAL/RU5,5TH RT ULNAR/RTYP5,5TH RT PATTERN/      01270
                        LR5,5TH LT RADIAL/LU5,5TH LT ULNAR/LTYP5,5TH LT PATTERN/      01280
                        RPAT1,1ST RT CKRC PATT/LPAT1,1ST LT CKRC PATT/                01290
                        RPAT2,2ND RT CKRC PATT/LPAT2,2ND LT CKRC PATT/                01290
                        RPAT3,3RD RT CKRC PATT/LPAT3,3RD LT CKRC PATT/                01300
                        RPAT4,4TH RT CKRC PATT/LPAT4,4TH LT CKRC PATT/                01320
                        RPAT5,5TH RT CKRC PATT/LPAT5,5TH LT CKRC PATT                 01330
            COMPUTE     RFRC1 = RU1                                                   02010
            COMPUTE     RFRC2 = RU2                                                   02020
            COMPUTE     RFRC3 = RU3                                                   02030
            COMPUTE     RFRC4 = RU4                                                   02040
            COMPUTE     RFRC5 = RU5                                                   02050
            IF          (RU1 LT RR1) RFRC1 = RR1                                      02060
            IF          (RU2 LT RR2) RFRC2 = RR2                                      02060
            IF          (RU3 LT RR3) RFRC3 = RR3                                      02080
            IF          (RU4 LT RR4) RFRC4 = RR4                                      02090
            IF          (RU5 LT RR5) RFRC5 = RR5                                      02100
            COMPUTE     LFRC1 = LU1                                                   02110
            COMPUTE     LFRC2 = LU2                                                   02120
            COMPUTE     LFRC3 = LU3                                                   02130
            COMPUTE     LFRC4 = LU4                                                   02140
            COMPUTE     LFRC5 = LU5                                                   02150
            IF          (LU1 LT LR1) LFRC1 = LR1                                      02160
            IF          (LU2 LT LR2) LFRC2 = LR2                                      02170
            IF          (LU3 LT LR3) LFRC3 = LR3                                      02180
            IF          (LU4 LT LR4) LFRC4 = LR4                                      02190
            IF          (LU5 LT LR5) LFRC5 = LR5                                      02200
            COMPUTE     BIDIC1 = LFRC1 + RFRC1                                        02210
            COMPUTE     BIDIC2 = LFRC2 + RFRC2                                        02220
            COMPUTE     BIDIC3 = LFRC3 + RFRC3                                        02230
            COMPUTE     BIDIC4 = LFRC4 + RFRC4                                        02240
            COMPUTE     BIDIC5 = LFRC5 + RFRC5                                        02250
            COMPUTE     RHFRC = RFRC1 + RFRC2 + RFRC3 + RFRC4 + RFRC5                 02260
            COMPUTE     LHFRC = LFRC1 + LFRC2 + LFRC3 + LFRC4 + LFRC5                 02270
            COMPUTE     TFRC  = RHFRC + LHFRC                                         02280
            VAR LABELS  RFRC1,1ST DIGIT RH RC/RFRC2,2ND DIGIT RH RC/                  03010
                        RFRC3,3RD DIGIT RH RC/RFRC4,4TH DIGIT RH RC/                  03020
                        RFRC5,5TH DIGIT RH RC/LFRC1,1ST DIGIT LH RC/                  03030
                        LFRC2,2ND DIGIT LH RC/LFRC3,3RD DIGIT LH RC/                  03040
                        LFRC4,4TH DIGIT LH RC/LFRC5,5TH DIGIT LH RC/                  03050
                        BIDIG1,BIMAN 1ST DIGIT RC/BIDIG2,BIMAN 2ND DIGIT RC/          03060
                        BIDIG3,BIMAN 3RD DIGIT RC/BIDIG4,BIMAN 4TH DIGIT RC/          03070
                        BIDIG5,BIMAN 5TH DIGIT RC/RHFRC,TOTAL RC RIGHT HAND/          03080
                        LHFRC,TOTAL RC LEFT HAND/TFRC,TOTAL RC BIMANUAL               03090
            COMPUTE     BIDIGR1 = RR1 + LR1                                           03100
            COMPUTE     BIDIGR2 = RR2 + LR2                                           03110
            COMPUTE     BIDIGR3 = RR3 + LR3                                           03120
            COMPUTE     BIDIGR4 = RR4 + LR4                                           03130
            COMPUTE     BIDIGR5 = RR5 + LR5                                           03140
            COMPUTE     BIDIGU1 = RU1 + LU1                                           03150
            COMPUTE     BIDIGU2 = RU2 + LU2                                           03160
            COMPUTE     BIDIGU3 = RU3 + LU3                                           03170
```

```
            COMPUTE     BIDIGU4 = RU4 + LU4                                          03180
            COMPUTE     BIDIGU5 = RU5 + LU5                                          03190
            COMPUTE     TOTRR = RR1 + RR2 + RR3 + RR4 + RR5                          03200
            COMPUTE     TOTLR = LR1 + LR2 + LR3 + LR4 + LR5                          03210
            COMPUTE     TOTRAD = TOTRR + TOTLR                                       03220
            COMPUTE     TOTRU = RU1 + RU2 + RU3 + RU4 + RU5                          03230
            COMPUTE     TOTLU = LU1 + LU2 + LU3 + LU4 + LU5                          03240
            COMPUTE     TOTULN = TOTRU + TOTLU                                       03250
            VAR LABELS  BIDIGR1,BIMAN 1ST DIG RAD RC/BIDIGR2,BIMAN 2ND DIG RAD RC/   03260
                        BIDIGR3,BIMAN 3RD DIG RAD RC/BIDIGR4,BIMAN 4TH DIG RAD RC/   03270
                        BIDIGU2,BIMAN 2ND DIG ULN RC/BIDIGU3,BIMAN 3RD DIG RAD RC/   03290
                        BIDIGU4,BIMAN 4TH DIG ULN RC/BIDIGU5,BIMAN 5TH DIG RAD RC/   03300
                        TOTRR,RH RAD RC/TOTLR,LH RAD RC/TOTRAD,BIMAN RAD RC/         04010
                        TOTRU,RH ULN RC/TOTLU,LH ULN RC/TOTULN,BIMAN ULN RC          04020
            PRINT FORMATS RFRC1 TO TFRC,BIDIGR1 TO TOTULN (0)                        04025
            PROCESS SBFILESALL
            CODEBOOK    TFRC,RFFRC,LFFRC,TOTRAD,TOTRR,TOTLR,TOTULN,TOTRU,TOTLU,
                        BIDIG1 TO BIDIG5,RFRC1 TO RFRC5,LFRC1 TO LFRC5,
                        BIDIGR1 TO BIDIGR5,RR1,RR2,RR3,RR4,RR5,LR1,LR2,LR3,LR4,
                        LR5,BIDIGU1 TO BIDIGU5,RU1,RU2,RU3,RU4,RU5,LU1,LU2,LU3,
                        LU4,LU5
            OPTIONS     4                                                            TEST
            STATISTICS  1,2,3,4,5,6,7,8
            READ INPUT DATA                                                          55555
```

```
0.15 : PROGRAM FREQ OUT -- KEY 3/77 VERSION
1.10 I
1.15 L A=0,I=0 ;PART 1 CREATES FREQ. DISTRIB.
1.20 T !,"A: CREATE FREQ. DISTRIB."
1.25 D 15
1.30 L XAX=NCAT*WCAT+OFF
1.35 D 2
1.40 D 3
1.45 D 4
1.50 T !,!,"FOR PLOT TYPE: DO PLOT"
1.55 S : ----------
2.10 T !,"ENTER DATA"
2.15 I DD=0
2.20 A !,"",DD T "   ",DD
2.25 I DD=999.99 G
2.35 I DD>=XAX!DD<OFF T "    OUT OF RANGE" G 2.20
2.40 L ONE=1 D 6
2.45 L NN=NN+1 I NN/10=((NN/10)/10)*100 T "    ",NN
 2.50 G 2.20
2.55 0 : ----------
3.10 T !,!,"CORRECTIONS - A TO ADD, D TO DELETE",!,"A/D    DATA"
 3.15 L A2.10:"A",A2.20:"D",8.30:"999.99"
3.20 S !," ",A,A
3.25 I $S(A.30,1.40)=0 G
3.30 I '($S(A.10,1.40)=0)&'($S(A.20,1.40)=0) T " ?!" G 3.20
 3.35 I $S(A.10,1.40)=A L ONE=1 D 7
3.40 I $S(A.20,1.40)=0 L ONE=-1 D 7
3.45 G 3.20
3.50 0 : ----------
4.10 T !,!,"FREQUENCIES",!,!,"CAT.   RANGE   COUNT"
 4.15 F I=1:1:NCAT D 9
4.20 T !,!,"# ENTRIES IN ABOVE TABLE = ",NN
4.25 0 ; ----------
6.10 L DA=(((DD-OFF)/WCAT)/100)*100+1 ; PUT NO. IN CAT.
 6.15 I DA<=250 L $B(DA)=$B(DA)+ONE
6.20 I DA>250 L $D(DA-250)=$D(DA-250)+ONE
6.25 0 ; ----------
7.10 A "     ",DD
7.20 I DD>=XAX!DD<OFF T "    OUT OF RANGE" 0
7.25 D 6
7.30 L NN=NN+ONE
7.35 0 ; ----------
8.10 A
8.20 D
8.30 999.99
8.40 999.99
9.10 T !," ",I,"   ",(I-1)*WCAT+OFF,"-",I*WCAT-.01+OFF
 9.20 I I<=250 T "     ",$B(I)
9.25 I I>250 T "     ",$D(I-250)
9.30 0 ; ----------
10.05 I
10.10 I "I=",I=0
10.15 T !,"B: ENTER FREQ. DISTRIB."
10.20 D 15
10.25 T !,!,"FREQUENCIES",!,!,"CAT."
10.26 I RNG=1 T "   RANGE "
10.27 T "  COUNT"
10.30 D 11
```

```
10.40 T !,"FOR PLOT TYPE: GO PLOT"
10.45 Q ; ---------------
11.10 L I=1
11.15 T !," ",I
11.16 I RNG=1 T "    ",(I-1)*WCAT+OFF,"-",I*WCAT-.01+OFF
11.20 A "    ",FRQ I FRQ=999.99 Q
11.22 I FRQ=-1 D 14 G 11.15
11.25 D 13.50,13.55
11.30 I I>=NCAT Q
11.35 L I=I+1 G 11.15
11.40 Q ; ---------------
12.10 T !,!,!,"CORRECT ITH CAT."
12.15 A !," I=",I I I=999.99 Q
12.20 I I>NCAT T " ?!" G 12.15
12.25 A " COUNT=",FRQ D 13.50,13.55 G 12.15
12.30 Q ; ---------------
13.50 I I<=250 L SB(I)=FRQ
13.55 I I>250 L SD(I-250)=FRQ
13.60 Q ; ---------------
14.10 A " SET NEXT CATEGORY NO.: ",I
14.15 I I<0!I>NCAT T " ?!" G 14.10
14.20 Q ; ---------------
15.05 L PLOT=20,MPLOT=25,RNG=0 ; SETUP, GET PARAM.
15.06 L RNG=1
15.10 F I=1:1:250 L SB(I)=0,SD(I)=0
15.15 A !,"NO. CATEGORIES = ",NCAT
15.20 I NCAT<1!NCAT>500 T " ?!" G 15.15
15.25 A !,"WIDTH/CAT. = ",WCAT
15.30 I WCAT<=0 T " ?!" G 15.25
15.35 A !,"1ST CAT. OFFSET = ",OFF
15.45 Q ; ---------------
20.03 I
20.04 L NLAB=5,POSH=0,POSV=-1,OMITL=0,YLEFT=-.6
20.05 L %P=.01,%S=.02,YHT=5,%O=0,%I=0,TICK=-.2 ; DO PLOT
20.08 I OMITL=0 T !,"TYPE 1-LINE LABEL",! R "",35.1
20.10 A !,!,"WIDTH IN IN. OF EACH CAT. ON PLOT = ",PW
20.12 I (PW<=0)!(NCAT*PW>10) T " ?!" G 20.10
20.20 A !,"MAX. Y VALUE (1<=YMAX<=1310) = ",YMAX
20.22 I YMAX<1 T " ?!" G 20.20
20.25 I '(OMITL=0) G 20.30
20.26 L J=YMAX/NLAB,K=(J/100)#100 I J-K>0 L YMAX=(K+1)*NLAB
20.30 L %O=.03 P 0↑0 L %O=0
20.35 T !,"SET ZERO PT. ON PLOTTER, TYPE GO",! R
20.40 L %O=.03 D 21 ; AXES AND AXIS LABELS
20.45 P 0↑0 F I=1:1:NCAT D 22
20.50 P XB:0,-.5↑-1.5 L %O=0,%I=0
20.55 Q ; ---------------
21.05 P 0↑0,NCAT*PW:0,0:0,3:YHT ; X,Y AXES
21.07 I '(OMITL=0) Q
21.10 F I=1:1:NLAB D 31 ; Y AXIS LABELS
21.15 D 32
21.20 P POSH↑POSV W "",35.1
21.25 Q ; ---------------
22.05 L XB=PW*I,XA=XB-PW
22.10 I I>250 L Y=SD(I-250)
22.15 I I<=250 L Y=SB(I)
22.20 L VT=Y,VB=YMAX,VB=YHT I Y<0 L VT=-Y
22.23 D 33 I Y<0 L NUMB=-NUMB
22.25 P XA:NUMB,XB:NUMB
22.30 Q ; ---------------
25.10 I
25.15 L SD=0,SI=0 ; PLOT GIVEN MEAN, SD
25.17 L XA=.03:P XA↑I+OFF,TICK=-.1
25.20 D 35 ; GET MEAN, SD
25.25 L %O=.03 D 37 ; Y BAR
```

```
25.35 I [illegible]
25.40 P [illegible]
25.45 T " [illegible]
25.55 P [illegible]
25.60 C ; -------------
26.20 A !,"[illegible] = ",[illegible]
26.25 I [illegible] T " ?!" G 26.2[illegible]
26.30 A !,"[illegible] = ",[illegible]
26.35 I [illegible] T " ?!" G 26.3[illegible]
26.40 A !,"[illegible] = ",[illegible]
26.45 I [illegible]>3 T " ?!" G 26.4[illegible]
26.50 T !,!
26.55 C ; -------------
27.10 L VI=[illegible]-OFF,V[illegible]=NCAT*NCAT,V[illegible]
27.15 I VI<0 L VI=-VI
27.20 D 33 I [illegible]-OFF<0 L [illegible]
27.21 P [illegible]:TICK
27.25 P [illegible]-.25↑-.4 T "Z" P [illegible]-.25↑-.25 T "-"
27.30 C ; -------------
28.10 L V[illegible]=NCAT*NCAT,V[illegible]=NCAT[illegible]
28.15 L IVI=[illegible]-OFF D 29
28.20 L IVI=[illegible]+[illegible])-OFF D 29
28.25 C ; ---------------
29.10 L VI=IVI I [illegible] L VI=-IVI
29.15 D 33 I IVI<0 L [illegible]
29.20 P [illegible]B↑0,[illegible]:TICK
29.25 C ; ---------------
31.10 L II=([illegible]+1-I)*(Y[illegible]/[illegible]),IJ=([illegible]+1-I)*(YMAX/[illegible]) ; Y AX LAB.
1320 P 0:II,TICK:II
31.25 I Y[illegible]<=10 L YLEFT=-.5
31.30 P YLEFT↑II T "",IJ
31.40 P 0↑II
31.50 C ; ---------------
32.10 P -.05↑-.4 T "",OFF ; X AXIS LABELS
32.20 P NCAT*PW↑0,NCAT*PW:TICK
32.30 P NCAT*PW-.1↑-.4 T "",NCAT*NCAT+OFF
32.40 C ; ---------------
33.10 L FAC=1,FAC[illegible]=1 ; COMPUTE (VI/V[illegible])*V[illegible], V[illegible]<13
33.20 I (VI>=0)&(VI<=.1) L FAC=1[illegible]
33.30 I (VI>.1)&(VI<=1) L FAC=10[illegible]
33.40 I (VI>1)&(VI<=10) L FAC=1[illegible]
33.50 I V[illegible]>=1[illegible] L FAC[illegible]=.01
33.60 I (V[illegible]>=10)&(V[illegible]<100) L FAC[illegible]=.1
33.70 L [illegible]=((((VI*FAC)/(V[illegible]*FAC[illegible]))*V[illegible])*FAC[illegible])/FAC
33.75 C ; -------------
35.10   WHITE FEMALES: BIMANUAL RIDGE COUNT (TRRC)
40.10 I
40.12 L XI=0,X0=0
40.15 T !,"C: ENTER FREQ. DISTRIB."
40.20 D 15
40.25 D 41
40.30 T !,"FOR PLOT TYPE: DO PLOT"
40.35 C ; -------------------
41.05 T !,!," CAT.",!,"START    COUNT"
41.10 A !," ",SCAT
41.15 I SCAT=999.99 [illegible]
41.20 L I=((SCAT-[illegible])/[illegible]CAT)+1
41.25 I I>(1/1[illegible])[illegible]SCAT>=[illegible]SCAT<OFF T " ?!" G 41.10
1[illegible] " "[illegible]
41.35 D 13 G 41.10
41.40 C ; -------------------
```

B.2.2 Karyotype Computer Program

C. Freed, M.D.

COMPUTER AUTOMATION OF LITHIUM TREATED CHROMOSOME ANALYSIS

Lithium treated metaphase chromosomes provide a more simple geometric image than customary preparations and thereby permit simplified and faster computer scanning techniques. The scanning problem is simplified because:

1. Chromosomes tend to be regularized to simple rectangular and trapezoidal shapes. (See Figure 1)

2. High contrast staining and compacted material gives sharper edges and allows single threshold object detection without losing detail or fragmenting objects.

3. Lithium treatment seems to reduce "stickiness" of chromosomes so that there are considerably fewer touches and crossovers to complicate images.

The program strategy is divided into three parts:

First, preliminary low resolution scans are done to select one of seven scanning spot brightnesses and to calculate the threshold which will eliminate background but preserve chromosome data.

Secondly, the whole slide is scanned with a resolution of 512X512 points. Data are stored in a ring buffer so no magnetic type storage is used. Objects are isolated and their areas and perimeters determined as they are encountered. A list storing the areas and perimeters is generated during the scan. As the perimeter of a given chromosome is being traced, A CalComp plot of the chromosome is done (Figure 2).

The third part of the program is output. The operator can pre-select the amount of output he wants from a given scan. Basically, there is a printout showing the area and perimeter of objects found in order by area (Figure 3). Corresponding to this is a CalComp plot of area versus perimeter (Figure 4). In addition, data may be accumulated from one scan to the next and a CalComp histogram of areas can be requested (Figure 4).

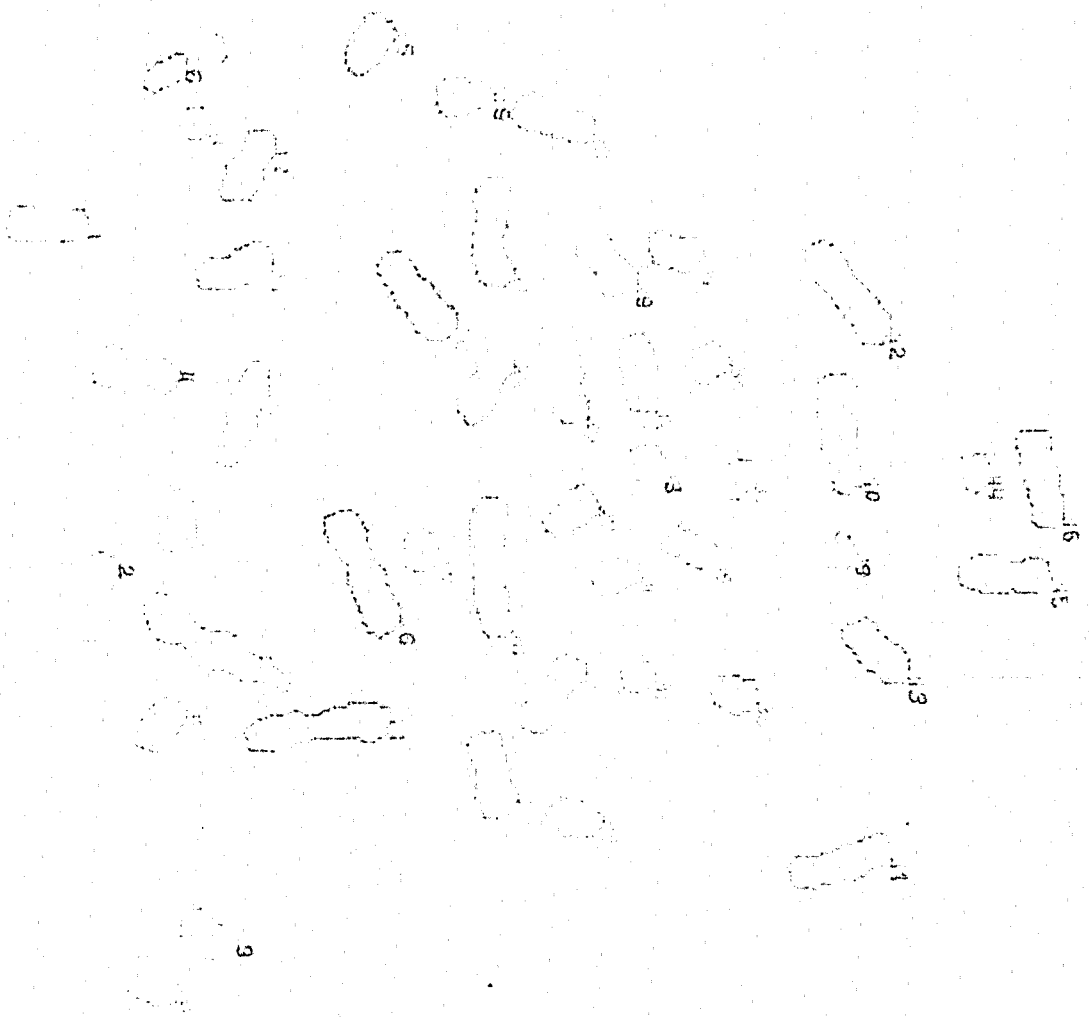
Preliminary observations indicate that these lithium spreads coupled with this scanning method can provide rapid screening and can draw attention to unusual cases for further study by more conventional human identification methods. Specifically, the scanning method outlined can throw out objects which are not in the size-shape range of chromosomes including cell bodies, linear strands, and irregular pieces of debris. It can give a total count of chromosomes and can give the count in three subgroups consisting of the four largest A chromosomes, the B and C, and the D through G. This information permits the following presumptive diagnoses to be made:

1. Normal male XY
2. Normal female XX
3. Super female XXX
4. Turners XO
5. Male trisomy 13 or 21 or XYY
6. Klinefelter's XXY or female trisomy 13 or 21
7. Super female XXX and trisomy 13 or 21

Methods are currently being evaluated to further distinguish the D through G groups.

Scanning takes about thirty seconds for the threshold computation and scan itself. If output is requested including plot of chromosomes, printout of area and perimeter, and plot of area versus perimeter, total scan and output time is five minutes per slide.

Figure 1



CalComp Plot of Chromosomes Found in Scan

Figure 4

Total Count

0046

I.D.#	Area	Perimeter
[illegible]	0067	[illegible]
0040	0076	[illegible]
0039	0077	0314
0031	0078	0319
0006	[illegible]	0342
0033	[illegible]	[illegible]
0037	[illegible]	[illegible]
0017	0099	0359
0036	0104	0364
0038	0113	[illegible]
0030	0114	0396
0035	0116	[illegible]
0034	0136	[illegible]
0019	0137	[illegible]
0027	0144	[illegible]
0028	0144	[illegible]
0005	0145	[illegible]
[illegible]	[illegible]	[illegible]
0003	0153	[illegible]
0007	0157	[illegible]
0015	[illegible]	[illegible]
0043	0191	[illegible]
0029	0191	[illegible]
0012	[illegible]	[illegible]
0001	0193	[illegible]
0032	[illegible]	[illegible]
0011	0196	[illegible]
0022	0201	[illegible]
0026	0205	[illegible]
0024	0214	[illegible]
0004	[illegible]	[illegible]
0023	0226	[illegible]
0045	[illegible]	[illegible]
[illegible]	0236	[illegible]
[illegible]	0244	[illegible]
0046	0246	[illegible]
0041	0251	[illegible]
[illegible]	[illegible]	[illegible]
0021	0272	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
0042	0293	[illegible]
0014	0341	[illegible]
0016	[illegible]	[illegible]
[illegible]	0347	[illegible]
[illegible]	0361	[illegible]

Total Area	Spot Brightness	Threshold

Figure 3

Printout of Chromosome Area and Perimeter in Order by Area

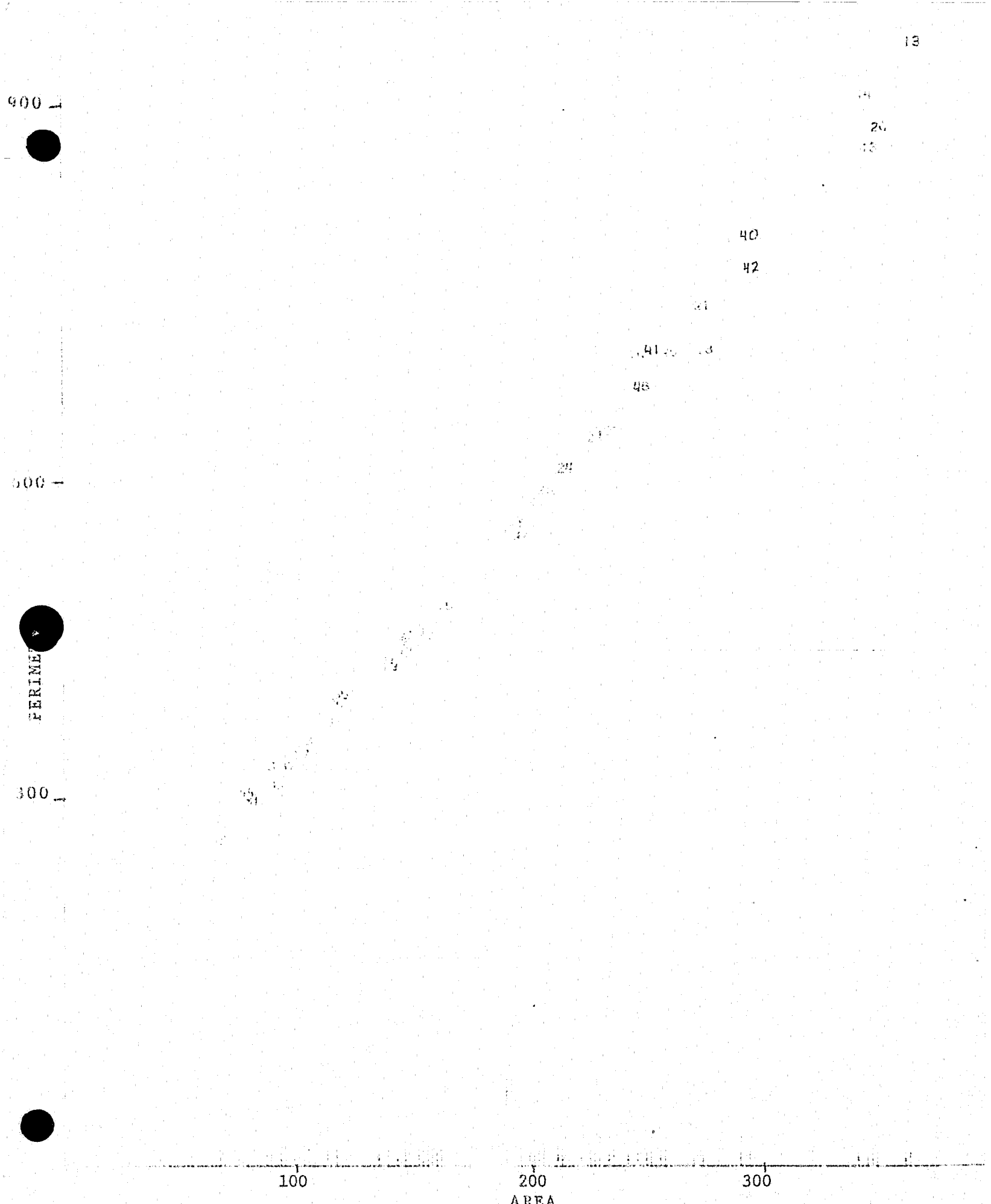


Figure 4: CalComp Plot of Area Versus Perimeter and Histogram Plot of Areas

B.2.3 ELECTROENCEPHALOGRAPH SIGNAL ANALYSIS PROGRAM - EPA

EPA is a multi-programmed System of 26 co-resident programs for the real time analysis and investigation of EEG and similar signals. Of these programs, six run continuously and provide system control and coordination. The remaining 20 may be invoked by the investigator to display, plot or average signals. Any programs which are not logically incompatible may run simultaneously. Thus, at any one time in a typical investigation, the computer might be simultaneously

* Averaging seven channels of analog signal and computing point by point standard deviations,

* Displaying a marker channel on a CRT to verify proper triggering,

* Displaying one channel of average response on a CRT,

* Plotting the average responses calculated so far on the Cal-Comp plotter,

* Displaying parameter values to the investigator on the teleprinter and accepting new parameter values from the keyboard.

EPA has been designed in a modular manner so that new programs and functions may be readily incorporated. Certain improvements now in development will extend its scope. In addition a program debugging feature, DDT, has been incorporated which allows the program developer to investigate and alter his program in real time while it is running.

EPA has been implemented on a Digital Equipment Corporation PDP-7 computer located in the Stanley Cobb Laboratory for Psychiatric Research in the Massachusetts General Hospital.

Tab

BOOK THREE

C. PUBLICATIONS

I N D E X

Historical Data in the Evaluation of Violent Subjects: A Hypothesis Generating Study *

Carlos E. Climent, M.D., M.S. Hyg. **

Frank R. Ervin, M.D. ***

Harvard Medical School

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It is the purpose of this paper to extend previous descriptive work[1] concerned with personal history variables related to violent behavior. In the present study a group of emergency room patients with a presenting problem of violence was compared with a matched control group of relatives of other emergency room patients. The aim of the present work is to present comparative data, generate hypotheses, and explore some of the methodological difficulties in the investigation of violent behavior.

The major areas considered in this study are neurological history and childhood psychopathology. Some attention is also given to criminal history, suicidal thoughts and attempts, drug and alcohol use, and family history. The association of violent behavior with organic brain disorder has been reported by many investigators [7,9], and the work of Hellman et al.[4] has suggested a connection between certain neurotic traits of childhood and violent crimes in adulthood. A positive correlation between violence and suicide has been reported by a number of authors, e.g., Whitlock et al.[8] and denied by others, e.g., Marten et al.[6] Many authors have reported a relationship between being beaten as a child and being violent as an adult.

Methodology:

The sampling frame was the Boston City Hospital catchment area, which comprises a socially deprived area and most of the ghetto section of Boston. We extracted two groups from that frame: a violent group (study) and a non-violent group (comparison group). A violent patient was defined as one who brought or came to the emergency room with

a chief complaint of violent behavior and with a reported present or past history of severe violent acts. These acts had to be against persons. Thoughts, verbalizations, or fantasies alone without acts of violence did not warrant inclusion in the study. Only repetitive violent behavior was included. No corroboration by a witness was required. A non-violent (control) subject was defined as someone willing to participate in the investigation who was at the emergency room accompanying a relative or friend who was to be treated for an orthopedic ailment and who, after specific questioning, presented no history of actions of adult violence.

A questionnaire pertaining to medical, psychological, and sociological issues was given to a trained research assistant who was not told the hypotheses or objectives of the investigation. For the interviews of both the violent and control groups, the interviewer stayed at the emergency room at different times of day and night and waited to be called to interview either violent subjects or controls, whichever were available at the time. Thirty percent of the interviews took place between 8 a.m. and 7 p.m.; seventy percent during the night, between 7 p.m. and 4 a.m.

The criteria used to match controls with violent subjects were age, sex, race and Boston residence. Many more potential controls were available, but only those who met the matching criteria as closely as possible were used. If the criteria were satisfactorily met, the interviewer did his best to obtain the data. When a patient with a complaint of violence was referred to the psychiatric resident on call, the

patient was then referred to us. The referring physician decided whether further evaluation or treatment were indicated.

Several factors other than the matching criteria affected the selection of the two groups. Among them were the subject's willingness to participate and the excessive work load of the hospital staff. Cases and controls were, however, affected equally.

Limitations:

We are only too aware of the limitations of a sample selected in the manner described. The interviewer knew that the study was about violence and whether the interviewer belonged to the case or control group but the interviewer did not have any information about the hypotheses or previous studies. The problem of recall affects any study based on interviewing patients and appears to affect both groups equally.

Another problem is the possibility of a bias in the selection of the controls. These controls probably represent a group more socially organized than the general population since they were willing to help someone else obtain treatment.

Results

In collecting the subjects for the violent group a total of 21 were excluded: 12 because of non-cooperation, and 9 because they were judged unreliable on the basis of contradictory data. For the non-violent group 44 exclusions were made: 12 because of lack of cooperation, 7 because of unreliabilty , and 25 because of evidence of violent acts

gathered during the interview.

The total number of subjects finally studied in detail was 80; 40 in the violent group and 40 in the control group. Clear evidence of violence or lack of violence was required for acceptance in the study.

The nature and size of the exclusions raise the question of the representativeness of the groups studied. However, tentative analysis of the data, obtained through the face sheet of the admission form to the emergency room, showed insignificant differences between the exclusions and the sampled population with regard to age, sex and race.

The mean age for the violent group (V) was 32 years, and for the non-violent group (NV), 28 years. Other demographic characteristics are presented in Table 1.

Insert Table 1 here

All of the subjects were residents of Boston. The great majority belonged to social classes four and five as defined by Hollingshead and Redlich. The components of the social class measure are education and profession. Twenty-five of the violent subjects were unemployed at the time of the study and only 4 of the control subjects. The average educational level for both groups was partial high school, although non-violent subjects were more likely to have graduated. With regard to marital status, there was a similar number of married subjects in both groups. A higher number of broken marriages was encountered in the violent group.

Of the violent group 14 or 35% were self-referred with a chief complaint of losing control of agressive impulses. Sixty-five

percent did not recognize violence as a problem within themselves and were referred by others. This group included those who came for some other problem but became violent in the hospital and patients who were brought by police or other people because of violent behavior. It also included those with a chief complaint other than violence who had a violent past history that was elicited by the interviewer in the hospital. Using CHI square analysis, there were several significant differences between the sub-groups of the violent group. The non-self-referred group presented more alcoholism ($p<.05$) and gave a history of being more frequently beaten by their mothers ($P<.01$). These results seem to suggest that the violent person who is brought in by others is a more socially disorganized subject than the self-referred one.

Childhood Information:

There were 14 items in the inventory dealing with childhood neurotic traits. These were rated as absent, mild, or severe in occurrence. No differences were found between the two groups with regard to sleepwalking, sleep talking, nail biting, thumb sucking, difficulty in talking, cruelty to animals, childhood stealing, hyperactivity, frequent nightmares, pyromania or enuresis.

Of the 14 variables, only three showed significantly greater severity in the violent group: stubborness, temper tantrums, and emotional deprivation. Mild forms of stubborness were defined as occasional episodes of short duration with only the parents aware of the episode. Severe forms were characterized by frequent complaints from outsiders as well as from parents. Mild temper tantrums were oc-

casional and short lasting episodes. Sever forms occurred daily and lasted for over an hour. Mild forms of emotional deprivation were defined as parental neglect or actual rejection with the parents being present. Severe rejection occurred when there were no parental figures present or when the parent was present but the child was left alone frequently and for long periods of time, (e.g institutionalized).

Physical assaults by parents were classified in three groups: 1) none, when no assaults reported; 2) justified and mild and done with an open hand; and 3) severe, when the assaults happened "at times" with no justified reason. A belt or fist was frequently used and, in many cases, objects such as canes or iron poles. A difference was found between the groups regarding severity of assaults; the violent subjects were more likely to have been beaten as children.

Table 2 shows the above data for five childhood traits. The categories have been grouped, so that the "none" and "mild" intensities are combined in the "No" category, and the "moderate" and "severe" intensities are combined in the "Yes" category. Chi square test showed that there were significant differences between the groups on some of the traits.

Insert Table 2 about here

Family Data:

Alcoholism in the father was significantly higher in the violent group ($P<.01$). The same pattern held for alcoholism in the mother ($P<.05$). Other findings are shown in Table 3.

Insert Table 3 about here

Criminality and Weapons:

To study the criminality of the two groups, crimes were arbitrarily classified as either violent or non-violent. The non-violent subjects had, by definition, committed no violent crimes. The non-violent crimes included joy riding, giving a false alarm breaking and entering without arrest, and arrest for alcoholism. No difference in frequency of these crimes was encountered between the two groups.

There was no difference between the two groups in ownership of rifles and guns. However, a significantly higher number of subjects in the violent group owned and used knives ($P < .02$). With respect to the use of firearms, hunting was more frequently reported in the control group than in the violent group.

Neurological Data:

When histories of head injuries under age 15 were examined, there were high rates of head injury in both groups and no significant difference between the two.

If severity of injury can be judged by the occurrence of unconsciousness (remembering or being told that unconsciousness followed the injury), significantly more violent subjects reported head injury with unconsciousness. Of the 19 violent subjects reporting head injuries before the age 15, 9 reported unconsciousness along with the injury. In contrast, only three in the control group reported unconsciousness.

Insert Table 4 about here

Five violent subjects reported convulsions before the age of 10 (grand mal, petit mal, TLE, febrile, unknown) as opposed to none

in the non-violent group. Over the age of 10, fifteen violent subjects suffered convulsions, as opposed to none in the control group.

Headaches were classified as mild, occurring less than once a month and easily controlled by common analgesics; moderate occurring two or three times a month and not easily controlled by analgesics; or severe, recurrent and incapacitating. The violent subjects suffered significantly more headaches.

Psychiatric Information:

Psychiatric variables regarding suicidal tendencies and psychiatric hospitalizations were investigated. As shown in Table 2, more violent subjects have been hospitalized for psychiatric reasons or have attempted suicide. In addition, the violent group had a significantly higher rate of suicidal thoughts.

Insert Table 5 about here

Drug Use:

Four patterns of alcohol use were designated. No alcohol ingestion; mild ingestion described subjects who occasionally drank but usually just at parties; moderate alcohol use described subjects who drank to relieve anxiety and who spent a substantial amount of money on alcohol, but whose consumption did not interfere with their functions at work or in the family; severe alcohol use described subjects who had financial, work, or family difficulties because of drinking. The frequency of drinking in the two groups, as well as whether or not they have used other drugs is shown in Table 6.

Insert Table 6 about here

Discussion:

Our data do not indicate that severe head injury, judged by unconsciousness, is an associated factor in adult violence. We observed the phenomenon in those under 15 and obviously in those over 15, since a violent subject has a greater chance of being hit in the head. Using any age over 10 years incurs the problem of including in the group a good number of individuals whose head traumas are already due to violent behavior. Coles maintains that it is after puberty that ghetto children get into fights and incur head injuries.[2] For the purpose of obtaining an unbiased sample, it appears that 10 years of age is a reasonable criterion age limit. Although our data do not support the association between early severe head injury and violence, we think that further investigation of this hypothesis could prove fruitful.

The relationship between head injury and criminality has been observed by several authors, e.g., Gibbens et al.[3], who showed that psychopaths with a history of head injury had a worse criminal record than those without head injury. Bach-y-Rita, et al. have also reported an association between head injury and violent behavior.[1] There appears to be a relationship between head injury in childhood and violence in adulthood, but it is still unclear as to whether it is cause or effect and how early in life and how severe it has to be in order to be causal.

Severe headaches and convulsions before age 10 were frequent in the violent group, which suggests that violent behavior may be influenced by organic brain disease.

With regard to childhood psychopathology, no difference was encountered in most of the items studied, with the exception of severe stubbornness, severe temper tantrums, and emotional deprivation. These were more frequently encountered in the violent group.

With regard to enuresis, firesetting and cruelty to animals, described by Hellman et al.[4] as predecessors of crime, our findings are inconsistent. This is obviously a matter that needs further study.

As to the relationship between violence and suicide, our findings support much previous work in this field. The violent subjects had more suicidal thoughts than did the control subjects. In a general way this supports the notion that aggressive impulses may be expressed either externally or internally, even in the same person.

Non-violent criminal history, defined for our purposes as breaking and entering without arrest, or more than one arrest for joy riding, giving a false alarm or alcoholism, was similar for both groups. Our results showed that although the two groups differ in several respects, they commit the same number of non-violent crimes. It seems that this kind of criminality occurs independently of violence. This datum suggests the hypothesis that criminal behavior as defined is related to cultural factors. To test the hypotheses that criminality and violence are independent and that there is a difference between violent and non-violent criminals with respect to biological factors, a future work of some interest might use only non-violent criminals as controls.

In summary, we suggest four hypotheses for further analytical investigation:

1) There is a positive association between history of

brain injury, e.g., severe head trauma, convulsions, headaches and violent behavior.

2) There is a negative correlation between some neurotic traits of childhood and adult violent behavior.

3) There is a higher prevalence of suicidal attempts among violent individuals than among non-violent individuals.

4) Criminal behavior (as defined) is related to cultural factors, while violent behavior is related to individual factors.

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Table 1

Demographic Characteristics of the Violent and Non-Violent Samples

	V	NV
Sex		
Male	34	31
Female	6	9
Race		
Black	13	13
White	24	27
Puerto Rican	3	0
Religion		
Catholic	24	18
Protestant	6	10
Other	10	12
Marital Status		
Married	15	16
Single	14	23
Widowed	3	0
Divorced	3	1
Separated	5	0

Table 2

Childhood Traits in the Violent and Non-Violent Samples

		V	NV
Stubbornness*	No	22	31
	Yes	18	9
Temper Tantrums*	No	24	34
	Yes	16	6
Emotional Deprivation*	No	18	37
	Yes	22	3
Physical Assaults, Father	No	24	14
	Yes	16	6
Physical Assaults, Mother*	No	31	39
	Yes	9	1

* $P < .05$

Table 3

Parental Characteristics of the Violent and Non-Violent Samples

Family data

	V	NV
Alcoholism - Father	15	2 **
Alcoholism - Mother	8	1 *
Criminal record - Mother	4	0
Parental divorce	9	7
Parental remarriage	4	3

*P<.05
**P<.01

Table 4

Neurological Characteristics of the Violent and Non-Violent Samples

Neurological Data*

	V	NV
Head injury before 15	19	12
Head injury before 15, with unconsciousness	9	3
Skull fracture	3	1
Convulsions ** before 10	5	0
Convulsions after 10	15	0
Severe headaches	18	5

* Totals exceed 40 because one person can have more than one of the reported data

** Grand mal, Petit mal, T.L.E., Febrile, Unknown

Table 5

Psychiatric Characteristics of the Violent and Non-Violent Samples

Psychiatric data

		V	NV
Psychiatric hospitalizations	No	35	40
	Yes	5	0
Suicidal thcughts *	No	11	28
	Yes	29	12
Suicide attempts	No	30	40
	Yes	10	0

* $P < .05$

Table 6

Alcohol and Drug Usage of the Violent and Non-Violent Samples

		V	NV
Alcohol Use	No	4	3
	Mild	14	25
	Moderate	2	8
	Severe	20	14
Marijuana Use	No	35	33
	Yes	5	7
Amphetamine Use	No	36	37
	Yes	4	3
Barbituate Use	No	35	39
	Yes	5	1
LSD Use	No	39	34
	Yes	1	6
Opium Derivatives Use	No	36	39
	Yes	4	1

Medical Variables Related to Violent Behavior
A Study of Female Prisoners[1]

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Medical Variables Related to Violent Behavior

A Study of Female Prisoners

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The relationship between biology and violence has been the subject of great interest and a substantial amount of recent research.

Many individual variables have been shown to be related to violence; for example, EEG abnormalities (Hill and Waterson, 1942; Stafford-Clark and Taylor, 1949; Williams, 1969). Epilepsy as a related factor has been studied by Bogicevic (1969) and Taylor (1969). I.Q. has been reviewed by Smith (1962), and chromosome abnormalities also in relation to violence has been reviewed by Penrose (1970) and Price (1968) and neurological abnormalities by Gibbens (1969).

It was the purpose of the present investigation to study the relationship between violent behavor and a broad range of biological parameters.

In addition, another purpose of the paper was to attempt to measure violent behavior by five different methods.

There are a number of reasons for using several measures of violence. First, is the fact that violence is a theoretical term and cannot be measured unequivocally by one single method. For example, violence as measured by a self-assessment questionnaire reveals a different aspect from violence measured by a legal label describing a crime (e.g. Assault). Second, the use of multiple measures increases the reliability of assessment of the variable under study. The reliability is increased in the psychometric sense that a five-item test is more reliable than a one-item test. Third, the agreement among multiple independent measures with regard to the relationship between violence and some medical variable increases the likelihood of a true relationship being demonstrated.

Method

The sample selected was a group of female prisoners at the Massachusetts Correctional Institution at Framingham (MCIF) with a capacity for 160 inmates. This selection was made for several reasons: the geographic accessibility, the willingness on the part of the staff

to cooperate, and the fact that there are no selective procedures used for accepting who is to be incarcerated in that prison, other than residence in a geographic catchment area. Because of the quick turnover of the inmates at the institution and the possibility of losing subjects, all the data were collected in three weeks.

Matching

Since the primary concern of the present study is the relationship between medical and psychiatric variables and violence, we have had to eliminate the influence of variables such as race or age. The procedure followed has been to select an equal number of black and white prisoners, matched on age, for the violent and non-violent groups. Any differences between them which are then obtained will be due to the influences of the medical and psychiatric variables per se. All data presented in the various tables, comparing violent versus non-violent subjects in this report, are based upon this kind of matching procedure for race and age.

Tests Used

The tests used were:

1. an electroencephalogram,

2. finger, palm and foot prints for dermatoglyphic analysis (as a gross indicator of chromosomal anomaly),

3. a W.A.I.S. I.Q. test,

4. a neurological examination done by a neurologist for detection of gross neurological abnormalities,

5. a gynecological examination performed by a trained gynecologist, and

6. a psychiatric interview by a psychiatrist.

In addition, an MMPI and the C.A.T. were also administered. Finally, a detailed standardized medical questionnaire (189 items) was also obtained with regard to history of medical illness, hospitalizations, diagnoses and symptoms about the subject and her immediate relatives. Institutional criminal and medical records were independently searched and relevant material was extracted.

The questionnaires were administered by trained social workers who read and explained the questions to the inmates. To assure the homogeneity of material obtained, some questions were accompanied by a detailed written description; e.g., "Before the age of 10, did you ever have (or were you told you had) fits, seizures, convulsions? By seizures we mean the following: shaking of the entire body, followed by unconsciousness with or without biting the tongue, wetting and messing".

The Problem of Measuring Violence

It is important to recognize that violence is a theoretical term, a complex phenomenon that cannot be described in one single way. Violence includes a number of different motivational aspects, such as disposition to anger, and it is also contingent upon many associated variables, such as the type of family environment and the type of neighborhood in which the individual lives. The appropriateness of applying this term to a particular individual and the probability that it should be applied in a particular case will be a function of many kinds of evidence from which an inference will be made. In view of these points, it is evident that a subject's degree of violence cannot be measured by one single test, judgement or observation. This implies the need to measure violence in many different ways. In the present study, the different measures of violence were used; each inmate was classified as either violent or non-violent according to each source. The various measures reflect as many aspects of violent behavior as possible ranging from the individual's own opinion to external observable behavior judged by others (i.e., judicial system, society or specific observers).

Measures of Violence

1. Self: A self-assessment questionnaire (Appendix I) was designed by the authors on the basis of previous clinical experience. The items had unquestionable face validity. Each inmate gave her own opinion of how often she showed certain types of behavior. An individual's score was the sum of the frequencies for each item on the questionnaire.

2. MMPI Profile: A particular MMPI profile described by Davis and Sines (1971) as significantly related to hostile and aggressive behavior in men was defined. Inmates who fell within the various limits of this prototype were labelled violent; those outside the limits were non-violent.

3. Correctional Officers: Two questionnaires, identical to the self questionnaires mentioned above, were filled out by two correctional officers who shared the daytime supervision of the inmates. Each officer was asked to report on the specific aggressive behaviors which she had observed. Each officer's form was scored in the same way as the self report; then the totals were summed up for the final score.

4. Prison: The Prison Administration prepared a list of the crimes they considered violent. Each inmate's entire criminal history (both present and past crimes) was reviewed. A woman was considered violent if she had ever committed a crime they rated violent: she was non-violent only if she had never committed any violent crimes.

5. Length of Sentence: Length of present sentence was chosen as an external measure of both severity of present crime and past history. In some sense it represents society's estimate of the dangerousness of the persons, the amount of time she should be punished or, alternatively, the amount of time needed for rehabilitation. The median sentence length at the prison was three years.

Results

Most of the descriptive results are shown in Table I. The vast majority of the prison population belonged to classes IV and V according to Hollingshead social rating of usual job.

Family History (Blood relatives)

Fifty-seven percent of the inmates reported family members who have had trouble with the law. Forty-five percent defined relatives as having been physically violent and thirty percent considered themselves to have been beaten unreasonably as children by these relatives. Thirty-five percent reported relatives suffering from some kind of mental disorder (mental retardation, senile dimentia or other). Twenty-seven percent have had some of their relatives in a psychiatric hospital. Eighteen percent reported relatives with speech or reading disabilities. Twenty-eight percent of the relatives have a history of drug addiction and sixty-one percent are rated as "drinking too much".

General Medical History

With regard to perinatal history, thirty-four percent of the inmates mentioned the fact that their mothers had some problem during their pregnancy such as hemorrhaging, excessive weight gain or high blood pressure. Two percent of the sample reported some problems during their delivery. These included: use of forceps, blue skin, hospital stay after mother was discharged, or being in an incubator.

Table II shows the distribution of specific diseases. The prevalence of medical disorder in the population as an overall is rather high especially for seizure disorders, headaches, heart disease, venereal diseases and other infectious diseases as well as head injuries and general surgery.

Dermatoglyphic Patterns*

As shown in Table III, the only dermatoglyphic patterns to be discussed in this paper are the finger patterns and the total finger ridge count (TRFC), a standard ridge count measure obtained by adding the individual ridge counts for all the fingers. There were more whorls and arches, and fewer ulnars and radial loops than reported by Holt (1968) for a control group of British women. The rate of arches was more than double that for the British females.

Comparisons Between Violent Behavior and the Different Variables

We have established a correlation criterion for the five measures of violence and the different variables. A variable has been considered as associated with violent behaviour when the results for that item have favored the violent rather than the non-violent group in all the five measures of violence.

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*Dermatoglyphic and chromosome analyses were performed by Dr. Lawrence Razavi at the Massachusetts General Hospital. These data comprise a preliminary report; fuller details will be published elsewhere.

Conversely, a variable is considered as associated with non-violent behavior when the data have favored the violent group in all of the violent measures.

Our justification for doing so is the following: we divide the prisoners into two groups of any one questionnaire item (e.g. childhood history of pyromania versus none). We can then ask for the probability that any one violence measure will be greater in one group rather than another.

The a priori probability is fifty percent since we have no reason to assume that one of the two arbitrarily defined groups is more violent than the other. We also must assume that the five measures of violence are in fact independent measures (i.e. uncorrelated).

Then for any questionnaire item we can calculate the probability of all (or some) of the measures of violence showing one group consistently more violent than the other.

The probability of one group being more violent than another in all of the five violence measures is three percent. We can assume then, that variables for which all the violent measures agree, are associated with violent behavior; on the other hand those in which no violence measures appear in favor of the violent group are considered not to be associated with violence.

It is on this basis that we will decide whether a particular variable is or is not associated with violent behavior.

If we were to decide that four our of the five measures of violence is evidence of association we will be dealing with events that occur by chance in about twenty percent of the cases.

We will report, nevertheless, those variables in order to show trends, but significant association will be considered only in the event that there is agreement among <u>all</u> the measures.

Table IV shows the sample sizes for the total population for violent and non-violent groups according to each of the violence measures.

It is evident that different measures of violence produce different distributions of violent and non-violent subjects. For example, according to the judgements of the Prison Administration about twenty-three percent of the prisoners are violent; whereas according to the judgements of the Correctional Officers, about fifty-four percent of the prisoners are violent by that criteria.

Table V shows the matched sample sizes for the total population on the basis of which all subsequent computations on this paper have been made. Note that the sample sizes have been reduced for most of the groups.

Table VI shows the correlation coefficients for the five measures of violence. The numbers in the table are the PHI coefficients calculated from the joint tables of each violence measure by all the others. This coefficient is a "corrected PHI" (Guttman, 1947) defined as:

$$\text{Phi Coefficient} = \frac{AD-BC}{\sqrt{(A+B)\ (C+D)\ (A+C)\ (B+D)}}$$

$$= .637$$

Most of the measures are not correlated with each other as shown by the low coefficients. The higher correlation being of .67 is that of the Prison Administration versus the sentence length. This seems to indicate that the latter two categories are judging a similar phenomenon (i.e. the subject's crime) rather than their own feelings about aggression, or their intra-institutional behavior. For the most part we could say that each of the measures are evaluating different aspects of the complex phenomena of violent behavior.

Associations Using the Five Measures of Violence
Variables Correlated With Violence

Using the above criteria, only five variables out of the 81 medical variables investigated for both the inmates and their blood relatives, were found to be associated with violent behavior. Those variables were:

1. hospitalization before age 10 because of head injury,

2. skull fracture before age 10 (most likely two independent questions tapping the same phenomena),

3. also a higher prevalence of gynecological surgery of all kinds,

4. a higher intelligence quotient and headaches in blood relatives.

Regarding the psychiatric variables, only homosexuality* and those variables related to early maternal loss were associated with the violent group (Table VII). Further analysis on the latter association is discussed elsewhere (Climent et al. 1972b).

Variables Associated With the Reliability of the Measures

We also found consistent results pointing to the reliability of our instruments; i.e.; the diagnosis of Dyscontrol Syndrome as diagnosed by the physician and the comment "Hostility" written by the social worker was higher in the non-violent group (Table VIII).

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* Homosexuality was defined as the agreement of two independent questions interspersed in the social workers' interview. The questions were: "Before entering the reformatory which of the following would you say was the most satisfactory way of attaining sexual pleasure?" Homosexuality was diagnosed if the answer was "Having sex with a woman". The second question was "Would you say that any of the following (items) pertain to you?" If the checked answer was "Homosexuality" for both questions then the inmate was considered homosexual.

Variables Not Associated With Violence

The only two variables associated with the non-violent groups are the clinical diagnosis of Neurotic depression performed by a psychiatrist and the history of psychiatric out-patient contact before first conviction (Table IX). The former finding is discussed in detail elsewhere (Climent et al. 1972c). Through the latter variable, we have tried to obtain a fair estimate of both the frequency and severity of psychiatric pathology before the legal psychiatric procedures have taken place, eliminating, therefore, psychiatric contacts related to the criminal conviction per se.

Perhaps an even more promising aspect shown in the analysis of our data is the tendency observed in those non-significant variables (i.e., the variables for which only four out of five measures of violence in either direction were reported): The variables that are found to be associated with violent behavior (at a non-significant level) are mostly indicative of some sort of neurological abnormality (i.e., neurological findings at examination, skull fracture after 10, headaches, head injury) or medical abnormality (i.e., high blood pressure, more medically prescribed drugs, and also suicide attempts and maternal loss before the age of 5).

On the other hand, the variables associated with the non-violent group are for the most part indicative of psycho-social pathology (i.e., alcoholism, drug abuse, alcoholism in the family, psychiatric hospitalization before first conviction, or father desertion before the age of 15).

The consistent trend shown between our significant results and these less strong associations is a rather striking finding.

With regard to neurological and GYN examinations, EEG abnormalities and dermatoglyphic patterns, no differences were encountered between the violent and non-violent groups regarding any of these parameters.

Neurological examinations were conducted on 96 subjects by a trained neurologist; the vast majority of the examinations were considered within normal limits and the few reported abnormalities were randomly distributed in both the violent and the non-violent groups.

As to EEG abnormalities, the nine abnormal tracings and the six borderline tracings were similarly distributed between the violent and non-violent groups in all five measures of violence. With regard to dermatoglyphic patterns, none of the four basic patterns investigated showed any significant differences between the two groups.

Discussion

One of the most striking findings of our investigation was the disproportionately high prevalence of medical disorders of all kinds in this population. Seizure disorders, headaches, heart disease, gonorrhea, congenital abnormalities, tuberculosis and allergies were reported by the inmates well above any general population statistics. Head injury has been reported on many occasions to be rather prevalent in prison populations (e.g., Roth 1972). Our data have corroborated this finding in a female prison group with 75.6% of the inmates having suffered head injury. Surgery (other than GYN) was reported by 81.6% of the inmates; this serves as another indication of

the degree of medical illness in this population. When neurological disorders are summed up together, 40% of the investigated subjects reported to have suffered it. Speech and reading difficulties were also reported in about 8% of the subjects.

Neurological examinations revealed scattered positive signs and the EEG results have shown a rather high prevalence of both abnormal and borderline tracings.

The four dermatoglyphic patterns investigated have also shown striking deviations from a female British general population (Holt, 1968). The most striking of the findings being the low TFRC, a finding that has been observed in the male prisoners as well (Roth, 1972). The above facts stand by themselves as unquestionable evidence of a need for major allocation of medical resources in this prison population.

Methodologically, we would like to emphasize several factors equally applicable to the study of criminality and violence as well as to prison studies. First of all, it is important that objective rather than subjective instruments are used in obtaining information of any sort; i.e., psychiatric, medical, social, etc. This is not a new claim, for as early as 1798 Pinel emphasized the need for a standard collection of data on mental patients if the understanding of mental disorders was of interest. Over 170 years later the same comment could be made regarding the study of criminality. We face a more complex dilemma, perhaps, but methodologically the same principles apply.

We have already acquired enough descriptive information regarding criminality and violence from this research and previous reports in the literature to formulate hypotheses that will keep investigators occupied for several years to come. It is of limited value, we strongly believe, to continue the study of criminality unless replicable objective instruments are used.

This becomes an even more important issue if what we want to study is the complex phenomena of violence (Violent Behavior). Due to its ambiguity it has little meaning to study just one of its multiple aspects. It has been our approach to use several independent measures of violence, what we consider the beginning of the only rational approach to the study of violence and its associated variables.

The second factor to be emphasized is the need for a multi-disciplinary approach to the study of violence and crime. We have demonstrated how by combining the expertise of several disciplines; i.e., medical interviews and examinations (neurological and gynecological), biological tests (dermatoglyphics and electroencephalograms), psychological tests, psychiatric interviews, and social workers' interviews. We found, to our dismay, that it is not only that this group of inmates are ill, in most of the investigated areas, but extremely ill in all of them. How can we obtain any meaningful data on the clarification of etiology of crime or violence or how can we even get an idea of what the problem is and what are the associations among variables of different disciplines, unless we study the problem using a multi-disciplinary approach?

Isolated efforts in the study of crime and violence from different areas have already been done in extenso (e.g., Wolfgang, 1967; Williams, 1969; Hill, 1942; Gibbens, 1969; Price, 1968). Everyone has found that there is always something wrong with criminals either biologically or otherwise. But the most interesting question remains still unanswered, "What are the associations that exist between the different variables?"

The third methodological aspect to be considered is the fact that, ideally, Incidence ("...the number of cases of the disease which came into being during a specified period of time") rather than Prevalence ("...the frequency of the disease at a designated point in time or the proportion of that population which exhibits the disease at that particular time," MacMahon 1970) should be used in the study of both criminal and violent behavior if institutional surveys are attempted. Obviously, if Prevalence data are obtained, the sample includes all the inmates at a given moment, a population heavily weighted with individuals with long sentences; those being the most deviant "legally" are perhaps the most deviant in all other respects as well (i.e., biological or otherwise).

We believe that the rigorous observation of these three factors will have a profound effect on the quality of data gathered, the use of which could be applied equally to etiological studies as well as to influencing the delivery of medical care in this population.

As to the specific results in the comparison of violent and non-violent groups in this population, the most striking factors that have emerged as associated with the violent group are the higher prevalence of some medical disorders -- i.e., neurological -- but also the evidence of important psychodynamic events in the lives of the violent individuals -- i.e., maternal desertion at an early age. This finding provides additional evidence pointing to the need for a multi-disciplinary approach to the study of violence. The analysis of data not associated with violence has shown the rather interesting finding of a higher frequency of psychiatric outpatient contacts before incarceration of the non-violent group, as well as higher frequency of depression in the same group.

This appears to suggest a pattern of medical pathology in the violent subjects and a pattern of psychiatric pathology in the non-violent female prisoners.

Data regarding the four biological parameters investigated (i.e., neurological examinations, gynecological examinations, EEG studies and dermatoglyphic studies) did not show significant results between the two groups. This does not mean that such a relationship does not exist. We have not demonstrated the association but we do have the conviction by looking closely at these results that there are a number of interesting variables that deserve to be further investigated using larger samples.

The above findings are corroborated by studying non-significant data (four out of five in either direction) for both groups which point to the same conclusions. Without qualifying the nature of the problem reported, most of the variables of neurological interest appeared associated

with the violent group. With regard to the variables of psychiatric interest, consistent results are also found:

The violent group contained the following psychiatric variables:

1. the diagnosis of Impulsive Personality and Personality Disorder, Other,
2. the MMPI, scales of Hypomania and Masculinity-Femininity and also
3. the variables: suicide attempts, maternal desertion before five years of age, and the childhood trait of "cruelty to animals."

The non-violent group contained the variables:

1. drug addiction,
2. alcoholism both in self and in relatives,
3. psychiatric hospitalization before conviction, and also
4. the items "being raised by real mother" and "father left before 15,"
5. the MMPI scale of Psychastenia.

Although the bulk of our findings tend to corroborate previous observations of our group (Climent 1972) with regard to the association of criminality with social factors, and violence with biological factors (in an equally criminal population), it leaves a great deal of unanswered hypotheses.

We don't know, for example, how one set of variables (e.g., physiological) is associated with another set of variables (e.g., social) and which are the mechanisms that are of importance to produce a pathological result (e.g., violence). It is in the interaction of these different variables that the answers regarding etiology of violent behavior and criminality are to be found.

We are aware of the fact that we are discussing a well-known unresolved dilemma -- that of Nature-Nurture -- but unless the contributions come from both parts of this dichotomy, we are bound to a vicious cycle with a very limited future.

We recognize that this is not an easy task; it implies that a number of investigators of different disciplines work together for several years to develop techniques and instruments to approach both aspects of the dichotomy in strict scientific terms.

Recommendations:

1) Medical screening should be performed routinely, in depth at admission of each new case.

2) Only standardized, replicable procedures should be used in the investigation of criminality of violent behavior.

3) Multiple measures should be used in the study of violent behavior.

4) A multi-disciplinary system, including sophisticated medical, psychiatric psychological and social aspects should be used in a coordinated fashion in order to be able to perform multiple cross-analysis.

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T A B L E I

DESCRIPTIVE ASPECTS IN A FEMALE PRISON POPULATION

Mean Age Population = 20.35

N = 158

POPULATION UNDER STUDY	N	%
Completed Tests	95	62.5
Refused to Cooperate	27	17.8
Released, Went to Court, etc.	22	10.5
Severely Mentally Retarded	4	2.6
Over 55	10	6.6
T O T A L P O P U L A T I O N	158	100

RELIGION	%
Catholic	50.0
Protestant	46.9
Jewish	2.0
Other	1.0

CRIMINAL HISTORY	
Mean Age First Conviction	21.4
Mean Number of Crimes	9.3
Mean Length Present Sentence	5.2

EDUCATION

Mean Grade Completed: 10.2

SD :

RACE	%
White	67.8
Black	30.8
Puerto Rican	0.7
Other	0.7
T O T A L	100

MARITAL STATUS	%
Single	47.9
Married	18.0
Divorced	13.2
Separated	16
Widowed	4.9
	100

TABLE 11 MEDICAL DISEASES FOR THE TOTAL POPULATION OF A FEMALE PRISON

Disease	#	N	%	Normative Data %
Seizure Disorder	19	139	13.6	
Major CNS Disease Other than Seizure	5	153	3.3	
Headaches	44	114	38.6	
High Blood Pressure	2	156	1.3	
Heart Disease	17	141	12.0	
Gonorrhea	21	137	15.3	
Syphilis	5	153	3.3	
Major Infectious Diseases	47	111	42.3	
Minor Infectious Diseases	59	99	59.6	
Ear Trouble	29	129	14.7	
Sickle Cell Anemia	2	156	1.3	
Congenital Abnormalities	7	151	4.6	
Cancer	1	157	.6	
Diabetes	0	158	0	
Thyroid Condition	1	157	0.6	
Kidney Pathology, Other than Infection	4	154	2.6	
TBC	13	145	9.0	
Asthma	10	145	6.9	
Allergies	26	132	19.7	
Head Injuries	68	90	75.6	
Major Injuries	37	121	30.6	
GYN Surgery	23	135	17.0	
Surgery, Other than GYN	71	87	81.6	
Delirious	23	135	17.0	
Fainting from Causes Other Than Seizures	22	136	16.2	
Speech and Reading Difficulties	12	146	8.2	
Neurological Disorders	64	158	40.0	

TABLE III

DERMATOGLYPHIC DATA FOR THE ENTIRE PRISON POPULATION AT FRAMINGHAM, MASS.

AS COMPARED WITH A BRITISH FEMALE POPULATION

DERMATOGLYPHIC PATTERN		FRAMINGHAM PRISON	BRITISH GENERAL POPULATION
TFRC	Mean	123.3	127.2
	S. D.	49.6	52.5
	N	92	825
Whorls		26.6%	23.9%
Ulnar Loops		60.7%	65.5%
Radial Loops		3.9%	5.9%
Arches		8.8%	4.3%

TABLE IV

SAMPLE SIZES FOR TOTAL POPULATION OF A FEMALE PRISON GROUP ACCORDING TO FIVE DIFFERENT MEASURES OF VIOLENCE

NUMBER OF SUBJECTS	SELF		MMPI		CORRECTIONAL OFFICERS		PRISON ADMINISTRATION		SENTENCE LENGTH	
	V	NV	V	NV	V	NV	V	NV	V	NV
	67	74	33	46	78	67	35	81	58	57

TABLE V

SAMPLE SIZES FOR MATCHED TOTAL POPULATIONS OF A FEMALE PRISON GROUP ACCORDING TO FIVE DIFFERENT MEASURES OF VIOLENCE

		SELF		MMPI		CORRECTIONAL OFFICERS		PRISON ADMINISTRATION		SENTENCE LENGTH	
		V	NV	V	NV	V	NV	V	NV	V	NV
Number of Subjects	Black	21	21	12	12	12	12	16	16	16	16
	White	37	37	19	19	39	39	18	18	33	33

TABLE VI

CORRELATION COEFFICIENTS OF THE FIVE MEASURES OF VIOLENCE

VIOLENCE MEASURES	SELF	MMPI	CORRECTIONAL OFFICERS	PRISON ADMINISTRATION	SENTENCE LENGTH
Self		.40	.12	.09	.11
MMPI			.17	.01	.23
Correctional Officers				.10	.2[illegible]
Prison Administration					.67
Sentence Length					

TABLE VII

VARIABLES ASSOCIATED WITH VIOLENT BEHAVIOR

		SELF		MMPI		CORRECTIONAL OFFICERS		PRISON ADMINISTRATION		SENTENCE LENGTH	
		V	NV	V	NV	V	NV	V	NV	V	NV
Headaches, relatives	Yes	17	9	11	9	12	10	9	7	13	10
	%										
	No	41	49	19	21	39	41	25	27	36	39
	%										
Gynecological surgery	Yes	9	7	7	5	7	6	10	3	12	4
	%										
	No	49	51	23	25	42	45	24	31	37	45
	%										
Real parental rejection	Yes	6	3	2	1	5	3	4	2	4	3
	%	22	17	23	7	27	17	27	13	19	15
	No	22	15	7	14	14	15	11	14	18	18
	%	78	83	77	93	73	83	73	87	81	85
Homosexuality	Yes	22	9	14	12	14	10	14	11	19	11
	%	81	64	82	71	78	67	93	79	76	73
	No	5	5	3	5	4	5	1	3	6	4
	%	19	36	18	29	22	33	7	21	24	27
Mother left before 10	Yes	6	4	4	3	5	2	5	3	4	3
	%										
	No	52	54	27	28	29	32	44	46	48	48
	%										
Hospitalized before 10 due to head injury	M	2.5	1.6	3.0	0	4.0	1.2	2.5	1.3	3.6	1.9
	SD	6.5	5.0	4.8	0	8.3	4.3	6.2	3.4	8.4	4.0
	N	28	19	13	14	15	26	12	16	14	21
Skull fracture before age 10	M	.74	0	0.7	0	.71	0	0,9	0	1.5	0
	SD	2.7	0	2.8	0	2.7	0	3.0	0	3.8	0
	N	27	19	13	14	14	25	11	17	13	22
WAIS, full scale	M	91	88	98	82	89	88	92	91	90	89
	SD	13	13	14	10	15	13	14	14	15	11
	N	25		15	12	22	13	21	11	21	22
Age at which maternal desertion occurred	M	7.4	15.9	4.2	12.3	10.8	14.2	9.6	18.1	9.4	15.3
	SD	8.5	15.2	7.3	9.5	15.6	14.7	9.3	17.0	17.4	11.9
	N	10	9	5	8	9	5	6	8	7	8

TABLE VIII
RELIABILITY VARIABLES

			SELF		MMPI		CORRECTIONAL OFFICERS		PRISON ADMINISTRATION		SENTENCE LENGTH	
ASSOCIATED WITH VIOLENCE			V	NV	V	NV	V	NV	V	NV	V	NV
Dyscontrol Syndrome	Yes	%	14	7	10	7	13	8	18	13	11	7
		N	7	3	3	2	5	3	5	4	5	3
	No	%	86	93	90	93	87	92	82	87	89	93
		N	42	40	28	29	34	36	23	28	39	40
Hostile	Yes	%	11	3	7	4	10	6	14	4	9	8
		N	5	1	2	1	3	2	3	1	3	3
	No	%	89	97	93	96	90	94	86	96	91	92
		N	39	33	29	28	28	23	18	25	33	36
NON-ASSOCIATED WITH VIOLENCE												
Cooperative		%	96	100	0	97	93	100	95	100	97	97
		N	43	34	0	29	28	36	20	26	35	37

T A B L E IX

VARIABLES ASSOCIATED WITH NON VIOLENT BEHAVIOR

		SELF		MMPI		CORRECTIONAL OFFICERS		PRISON ADMINISTRATION		SENTENCE LENGTH	
		V	NV	V	NV	V	NV	V	NV	V	NV
Neurotic depression	Yes	13	15	7	11	11	15	8	10	10	15
	%	27	35	23	36	29	39	29	32	23	35
	No	36	28	24	20	28	24	20	22	34	28
	%	73	65	77	64	71	61	71	68	77	65
Psychiatric outpatient contact before first conviction	Yes										
	%	27.3	50	23.1	41.7	20	56.3	25	38.5	18.8	47.4
	No										
	%										

APPENDIX I

SELF ASSESSMENT QUESTIONNAIRE

Question #	Never	Once Twice	Once in Awhile	At Times	Frequently	Very Often
1. Do you pick arguments?						
2. Do you get mad easily?						
3. Do you hit the walls or slam doors?						
4. Do you verbally threaten people?						
5. Do you break windows, smash dishes or things?						
6. Do you get wild after a few drinks?						
7. Do you get involved in physical fights (brawls, scratching, pulling hair, kicking, biting)?						
8. Do you look for physical fights?						
9. Have you tried to harm someone?						
10. Have you actually harmed someone?						

A number from 0 to 5 was assigned to each question, according to the frequency shown.

For example:

Never = 0
Once or Twice = 1
Very often = 5

ABNORMAL SEX CHROMOSOMES AND DERMATOGLYPHICS IN PHYSICALLY AND INTELLECTUALLY NORMAL SEX OFFENDERS

L. Razavi, M.D., M.P.H.

A priori it seems that those with chromosomal anomalies will have congenital malformations. In some cases these may be of a specific sort, over and above the general disturbance caused by an unbalanced genome, and particularly related to the chromosomal genes interfered with. It is usually understood that in sex chromosomal anomaly sexual maturation may be disturbed as far as the genitalia and secondary sexual characteristics are concerned (1); but it is not known if the distrubance extends from the gonads to the sexual centers of the brain (2), or even remains localized to the neuro-endocrine axis, and much argument about the effects this may have on social behavior (3).

These uncertainties arise because several epidemiological, cytological and embryological questions remain unanswered.

In the first instance the frequent association of sexual aneuploidy with somatic or intellectual defect causes problems in ascertainment of suitable populations to test this hypothesis rigorously. The concurrence of psychopathy and aneuploidy in hospitals or institutions for mental defect cannot be used as good evidence for independent association of chromosomal constitution and behavior. The bias of these populations towards overt mental and physical defects prevents the distinction of behavioral disorders subtly related to specific neuro-endocrine dysfunction from those mediated by serious intellectual or somatic maldevelopment. Second, the connection between a solitary sample of lymphocyte chromosomes and behavior is unclear. Third, the rate of chromosomal variation from conception to old age is simply

not known. This must influence somatic differentiation just as upbringing influences social orientation. In all events satisfactory controls for cytogenetic surveys in prisons are hard to find.

The rate of sex chromosomal (gonosomal) aneuploidy is higher in hospital cases than in the general population (whether newborns, or less satisfactorily randomized adults are chosen for comparison -- see Fig. I); and in these cases it is higher among those with reproductive difficulties than, say, cancer. This is expected because gonosomal aberration leads to illness, and most probably to genital illness. In mental institutions all chromosomal anomalies are more frequent than in the general population, as expected, but while autosomal aberrations (particularly G Trisomy) predominate in mental deficiency, sex chromosomal disturbance is most frequent in mental illness, and increases in mental defect only if this is accompanied by focal epilepsy.

In other words it seems that if one searches in hospitals and mental institutions for people with irregular sex chromosomes they are most frequently to be found among cases with specific (sexual) malformations and special or even focal mental disorders. This seems reasonable because sex chromosomes mostly govern local rather than general development of body or brain.

But even here the picture is not uniform. There is considerable variation in the clinical appearance of cytogenetically certified cases of Turner's (XO) and Klinefelter's and excess Y Syndromes (3, 4, 5, 6). XO's are not found more frequently in mental institutions than elsewhere (7,) yet are known to have special cognitive defects and focal epilepsy (8, 9, 10, 11).

The most consistent trend in individuals with increasing numbers of X chromosomes, apart from infertility, is increasing mental deficiency (12, 13, 14); some may even mimic Down's Syndrome (15, 16). The distribution of I.Q.'s in Klinefelter's Syndrome (XXY) remains the same as the general population.

In criminal matters sex aneuploidy is commonly found among mentally defective criminals. The XYY constitution is easier to find among tall male criminals who are persistently aggressive, repeated offenders or otherwise hard-to-manage (17), yet XXY males are frequently as tall (18, 19) and as often criminal (20, 21, 22, 23). Buccal chromatin abnormalities in specifically sexual psychopathy are usually accompanied by educational sub-normality (24, 25) or, if without mental defect, they occur at a rate little different from the rate in mental defectives (26). The implication is that detailed testing of I.Q. would reveal the latter to be truly sub-normal and that crime is a secondary result of the general mental deficiency. At the same time, legally detained sexual offenders can provide a yield of over 10% of gonosomal aneuploids -- a fifty-fold concentration of the incidence in newborns -- without obvious clinical disability (27, 28). Some of them may never have entered a hospital.

On the other hand, whether or not chromosomal anomalies lead to crime they can be found more easily (if not more frequently) in prisons than elsewhere, and they are often complicated by serious diseases such as leukaemia. Though they escape detection by hospitals and practitioners, they can yet be found in special prisons, and the information collected as a public health measure can also be used to decide whether or not there is a biological

abnormality consistent with undesirable behavior.

In order to measure the prevalence of chromosomal mutation in adult males, I obtained permission to do serial chromosomal analysis on inmates at a state psychiatric treatment center for sexual offenders. The center is an epidemiologically closed population but open to community-wide experiences of viral infection or chemical and physical agents. The chromosomal survey was done in isolation from other psychological research and treatment being carried on. Drugs are not normally used for treatment.

At this center the primary ascertainment is socio-legal, not medical; the patients are apprehended because of dangerous sexual behavior, and referred for psychiatric investigation at a court hearing (29) after they have been arrested. They are not considered physically or mentally sub-normal, have not attended hospitals or mental institutions nor are they generally criminal. Their sexual misbehavior need not be violent, though it is usually persistent. These distinctions which are essentially operational serve the functions of clarifying the hypothesis of a specific link between karyotype and behavior and of testing it rigorously. I have been able to show a consistent pattern of chromosomal abnormality only by testing cases several times over three years. Out of the whole group so far 83 have been satisfactorily tested in this way. This smaller group was in the study from the outset and may therefore be treated as a single population in whom adequate sampling has been possible. There are odd chromosomal constitutions among other inmates but these have not been sampled frequently enough to bear comparison. Assuming a random mix in the blood, this gives a one in a thousand chance of missing a single representative cell of a mosaic in

whom a fifth of the cells are uniformly abnormal (see Table I). The first samples were harvested after three to four divisions in culture, and the remainder after synchronization at the first division (30).

In 83 cases (Table II) there are: 6 (7%) - who have consistently abnormal sex chromosomes in 20% or more of their blood cells of whom three have almost all cells affected all the time; 1 (1%) - with an autosomal abnormality in all cells; and 5 (6%) - with abnormal sex chromosomes consistently affecting less than 20% of the blood cells.

The first rate (7%) is about thirty-five times the known rate of sex chromosomal abnormality in newborn children (.2%) (31). If the five mosaic individuals, with less than 20% of odd blood cells are included, the frequency of sexual aneuploidy increases to 12/83 (14.5%). The overall rate is then about seventy times the expected rate in the general population.

In this study, karyotype varies in two ways (Fig. II): either it fluctuates within 10% on either side of a mean -- and this may be taken to be a random variation related to variable mixing of cells in blood, selection in tissue culture and sample size -- or it mounts or declines progressively at a rate about 0.5-0.75% a month -- a tentative estimate based on the cases followed over three years.

Dermatoglyphics commonly reflect chromosomal constitution, including sex differences, and are used as clinical screens for cytogenetical analysis (32, 33). In these cases qualitative and quantitative traits (patterns, ridge counts and tri-radial locations) are taken from palms as well as fingers, and sometimes feet. In the sex offenders I found that most of

the chromosomally disordered cases could be picked out by using finger prints already collected by the police (34).

In general, the presence on fingertips of more than severe ulnar loops, five whorls or arches, or two radial loops (on digits besides number two) are unusual enough to make further study of quantitative traits and palms and symmetry worthwhile. In the whole group of sex offenders, the general distribution shows an increase of arches at the expense of whorls in cases having excess chromosomes (Table III) a characteristic of females rather than males. In 22 cases there is a notable increase of one pattern and of these six (26.8%) are chromosomally abnormal. Thirteen cases have eight or more ulnar loops of whom three are chromosomally abnormal; five have ten whorls of whom two are chromosomally abnormal, three have three radial loops with one on the first digit, of whom one is abnormal; and a single case with nine arches is chromosomally abnormal.

The average total finger ridge count (TFRC) of men differs from women (148 and 127 ridges respectively) probably because of a quantitative effect of sex chromatin (35). In the sex offenders, the mean TFRC is 140, between normal male and female averages. Presumably this goes with the increase in arches (which have a ridge count of zero). The distribution of TFRC's in the whole group (Fig. III) is bimodal with peaks at 70 and 150. For full aneuploids (cases 1-3) it is 49, and in all cases having excess sex chromosomes in over a fifth of their cells the mean is 95. A major XY/XO mosaic (case 6) has least sex chromatin and a count far above the male mean. The lesser aneuploids are generally hyperploid and below the female mean, but in two (cases 8 and 10) the count is discordant. Of twenty-two patients

with fingerprints, at least one standard deviation beyond the male mean (148±52) five have chromosomal anomalies (22.7%). These are contained within the minor mode of the frequency distribution of total finger ridge counts (Fig. III).

In the whole group of 83 inmates, 34 (40.9%) have odd dermatoglyphs chosen by ridge counts or pattern frequency in the fingertips only. Sixty percent of all aneuploids are included: this is made up of 70% (5/7) major cases and 40% (2/5) of the minor cases. Among the 34, the yield of aneuploids is 20.5% (7/34). The yield of sex chromosomal aneuploids (17.6%) (6/34) is eighty-eight times the rate in newborn males.

Penitentiary clinical records, kept without particular consideration of genetical illness, showed that one major case had diabetes and testicular atrophy, a second a minor genital anomaly and a third neuro-fibromatosis. One was fertile; the autosomal aneuploidwas sterile and all other cases appeared unremarkable. In all inmates, secondary sexual characteristics -- external genital development, hair distribution and shaving frequency, voice and stature -- are mostly normal and intelligence can be fairly high.

The mean I.Q. (W.A.I.S.) of all inmates is 96.4, of major aneuploids carrying excess chromosomes 94, and of minor mosaics 101. There is a trend towards a lower I.Q. in cases with the highest proportion of cells affected; the distribution in all sex offenders suggests a secondary peak at I.Q. 65 but is otherwise normal.

Three aneuploids (XXY, XY/XXY and XY/XYY) are over 70" in height. The mean of Y hyperploids, 65.5", is below the mean of X hyperploids, 71.6". The aneuploids' heights are accurately measured but there is a very unusual distribution of heights in the whole group (Fig. III) heavily clustered between 64" and 72". These are often reported by the inmates in the records rather than measured and are a better reflection of conformism than physique.

Social characteristics of the inmates (as collated by Dr. Ralph Garofalo) are: early or middle birth order with four to six siblings, a small urban upbringing under conservative family attitudes, irregular schooling and sporadic jobs. First offenses were usually in adolescence; and at admission to the center there had been either four or no previous convictions, with pedophilia against 6-16 year old victims the commonest crime. Previous hospitalization, drunkeness, non-sexual crime and the use of dangerous weapons were all rare.

The aneuploids differ from the rest of the inmates in being notably more resistent to therapeutic measures, passively as well as aggressively. (Fuller information on these matters will be published elsewhere)

From this and another study (25), I estimate the rate of gonosomal aneuploidy among legally (independently) ascertained adult male sexual offenders to be about one in ten. This manyfold excess over the rate in newborn populations (1/500) can be taken as good evidence that chromosomal and behavioral disorders can be connected specifically: at both levels the disorder is sexual. Can this be connected by sub-clinical (perhaps neuro-endocrine (2))

pathways as well as by mentally defective or neurotic reactions to a patently odd sexual physique?

Figure I shows that the tighter the epidemiological test the better the yield on each pathological level at which sex chromosomal disorder can be expressed -- physical, mental or social.

In hospitals one finds sex chromosomal disorders most easily by concentrating on sexual diseases. Though sexual disease is often accompanied by sexual neurosis, this probably arises only secondarily as a result of patients finding themselves with abnormal sexual physique or reproductive function, and not as a more direct result of genetic character on their responses.

If there is a true link outside hospital between genetic and social disorder, without the intervention of physical sub-normality, then this should be most clearly seen as an especially high prevalence of sex chromosomal defects in those who misbehave sexually.

Sex offenders are institutionalized not for illness but because of a socially undesirable act. In epidemiological terms, the method of ascertainment is not initially biased towards specific physical or intellectual defects but towards social failure. In other words, they are physically acceptable and have proved less likely to be noted because of somatic disorder than because of social disorder. Any excess of genetic abnormality, therefore, may be attributed to a real association with the socially undesirable behavior.

Though this may be replacing omissions in medical detection with errors in social diagnosis, the operational distinction is real insofar as crime is socially rather than biologically defined. However, the connection between biological and social disorder must derive from the distribution of abnormal cells in the body. This is reflected in the association of both chromosomal and dermatoglyphic character with sexual crime.

The offenders with excess chromosomes (cases 1-12 except 6) have an average three times more arches than other inmates (13% vs. 4.3%); and in 1906 Ascarelli (36) found a similar increase in prostitutes compared with women of "diverse occupations" (4.3% vs. 1.2%). Presumably, this confirmation from widely separate sources reflects a common biological connection between dermatoglyphics, chromosomal character and neuro-endocrine development. Provided note is taken of racial distributions, dermatoglyphs should prove a useful screen which can double the efficiency of cytological surveys in special populations outside hospitals.

In the sex offenders, where distribution of races is the same in aneuploids as in others, some fingerprints are discordant with karyotype (cases 5, 8, 10). There may be chance divergence of random variation and sampling error of the two characters: the standard deviation for human ridge counts is 50, and repeated chromosome counts in a stable mosaic can vary over a range of 20% without being progressive. Alternatively, the line predominant in volar skin during embryogenesis is no longer available in blood: mosaic proportions vary among tissues as they multiply at different rates.

The rate of change is also a function of senescence and mitotic error but it is not known in whom senescence starts sooner than others.

In progressive aneuploids, the rate of change over several years is 0.5-0.75% per month which compares with a rate of 0.4-0.6% per month in adult mosaic XXY's (38) and G trisomics (37). It is much slower than in rapidly growing infants with mosaic G trisomy (39) and complex D/G translocations (40) in whom lines may advance at 2% or disappear at 5-30% of cells sampled each month. In the sex offenders, I have no evidence that this is influenced by seasonal or sex-dependent infectious agents which act on non-disjunction in newborns (41, 42, 43).

If there is dermatoglyphic oddity suggesting a certain karyotype, yet blood tests are normal or discordant, karyotype evolution may have occurred. In some aneuploids unstable spindles begin losing chromosomes relatively early, so that a single hyperploid line may evolve into various mosaics composed of hyperploid (XXY, XYY), diploid (XY, XX) and monosomic (XO, YO-lethal) lines. In post-gestational life, then, discordance can develop between chromosomal constitution and fingerprints.

It is reasonable to consider that aneuploid foci exist in other parts of the body within particular mosaic tissues or as ectopic aggregates. This is because chromosomally unbalanced cells migrate poorly during differentiation. In later life some clones may be selected against a previously established equilibrium, the rate of senescence may be increased to unstable limits. The result is that very specific parts of the body not always amenable to examination may be affected and vary over time.

It should be emphasized that for technical reasons almost all chromosomal tests are done on blood or skin, not brain or glandular tissues, yet focal congenital malformations such as cleft palates may be aneuploid in the

affected area alone (44). Focally aneuploid areas can remain sessile but there is a noted association between congenital aneuploidy and later malignancy (46, 47). This means that hyperplasia is common and follows the demands of life. In gonosomal aneuploidy the demands occur in neuro-endocrine centers and during secondary sexual maturation.

In other words, aneuploid cells may be randomly dispersed or clustered: in either event differential multiplication will produce local areas with new structure and function vis a vis the surrounding tissues. Cerebral and skin cells are less likely to show this because they are almost at once at the site of irreversible determination. But neuro-endocrine tissues (derived from foregut and ependyma) migrate through several regions and unstable cells will be more often waylaid while proliferating en route. In this way a gonosomal defect limited to one embryonic area has localized representation in adult life and even narrower social expression.

This may explain why there has been so much confusion about the highly variable association of certain sex chromosomal disorders and mental deficiency, physical incongruity or behavioral problems: the final biological outcome is the result of many factors operating variably over time. The implication is that sex chromosomal anomaly may be differentially expressed and in some cases confine its effects to those somatic structures in the neuro-endocrine system which are the physical basis for sexual behavior.

It is worth noting that detailed palmar measures of bimanual symmetry and pattern associations increase the yield among minor mosaics so that all are detected with double efficiency in concurrence with differences predicted by sex chromosomal constitutions. Forty-four of the 83 inmates have odd palmar

or fingerprints under these criteria and this includes all of the aneuploids. But until computer storage of genetic as opposed to police (45) classifications is readily available they are not feasible for screening. Presumably, the major cases are those at most risk for the complications of chromosomal disorder; ordinary clinical perusal is sufficiently fast to detect these cases at the time of their first admission when general clinical appearance may not be considered remarkable.

It seems good public health practice to detect such high risk cases suitably early and also to be aware of their high risk families, for they can suffer from several endocrine, skeletal and other complications (46, 47, 48). The yield is reasonable even at the proportion of 20% of cases screened. This is because each serves as a window on the community and because the "malignant" social as well as clinical disorder these cases carry affect many others besides themselves. It appears also that prisons and courts are as likely sources for these people as hospitals. This raises important questions about the mode of therapy to be undertaken along with restraint. For the time being, it seems reasonable to examine most closely for complications those in whom more than 20% of cells consistently reveal odd chromosomes and follow them with serial tests.

This population is highly at risk with a particular concentration of sex chromosomal aberration. One can picture this as a concentrated sample of the variants which are in the general population and conclude that the concentrating agencies have been upbringing, education and experiences of life. The deterministic implications of a specific and relatively direct connection between sex-chromosomal and sex-behavioral disorder may therefore be avoided by consideration of these agencies.

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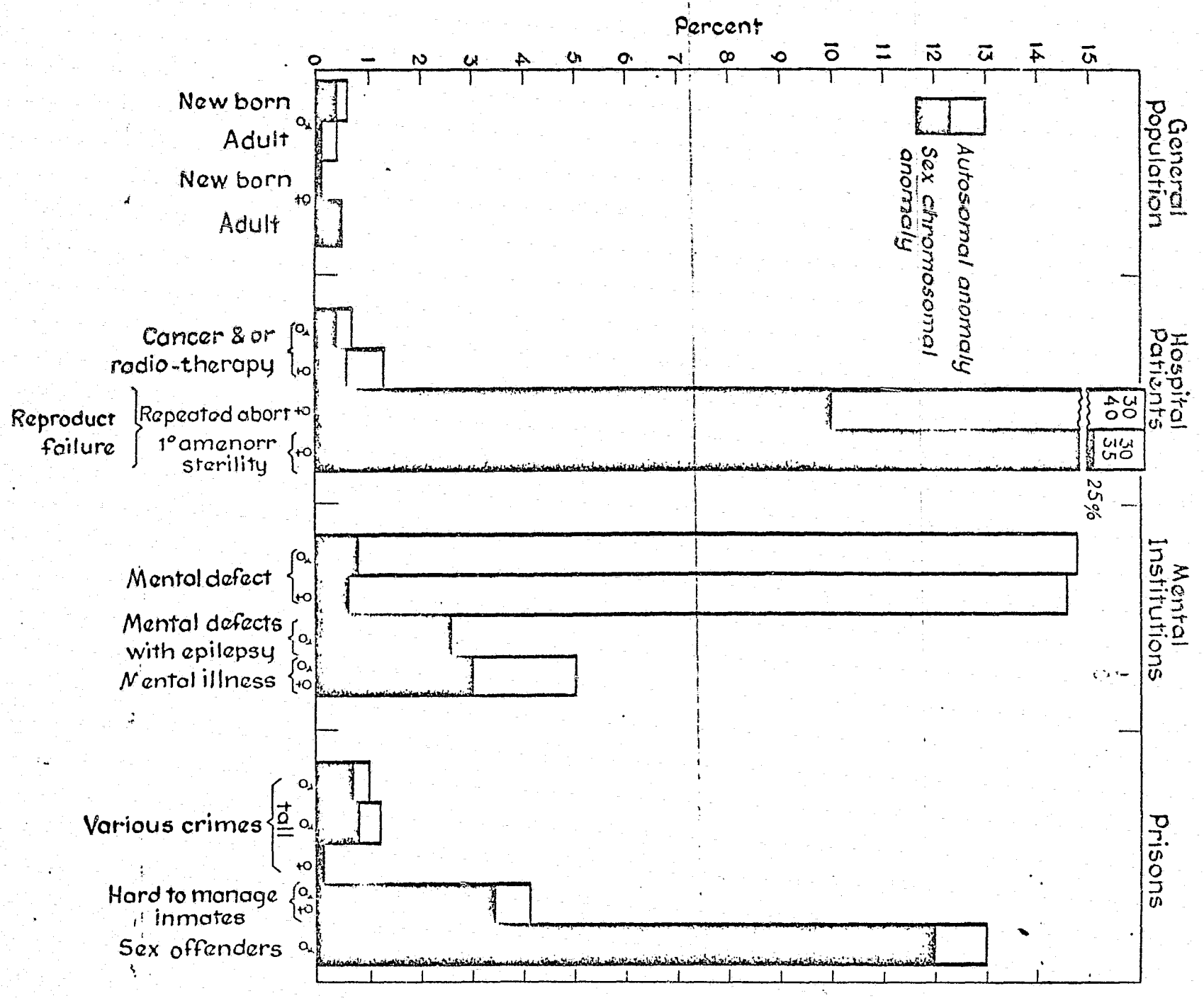
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
New born
Adult
New born
Adult
Cancer & or radio-therapy
Reproduct failure
Repeated abort
1° amenorr sterility
Mental defect
Mental defects with epilepsy
Mental illness
Various crimes
tall
Hard to manage inmates
Sex offenders
Autosomal anomaly
Sex chromosomal anomaly
General Population
Hospital Patients
Mental Institutions
Prisons
30
40
30
35
25%

FIGURE I

FIGURE II A

Karyotypic progress

Note that in case 4 (XY/XYY aged 22) the proportion of aneuploid cells, is increasing, while case 1 (XXY aged 26) remains stable. In general a mosaic case may be defined primarily as an unstable aneuploid in whom the rate of production of aneuploid cells varies over time. Full aneuploids on the other hand maintain an apparently stable population in which observed variation is satisfactorily attributable to sampling error. We may expect the risk of cancer to be highest in the unstable case.

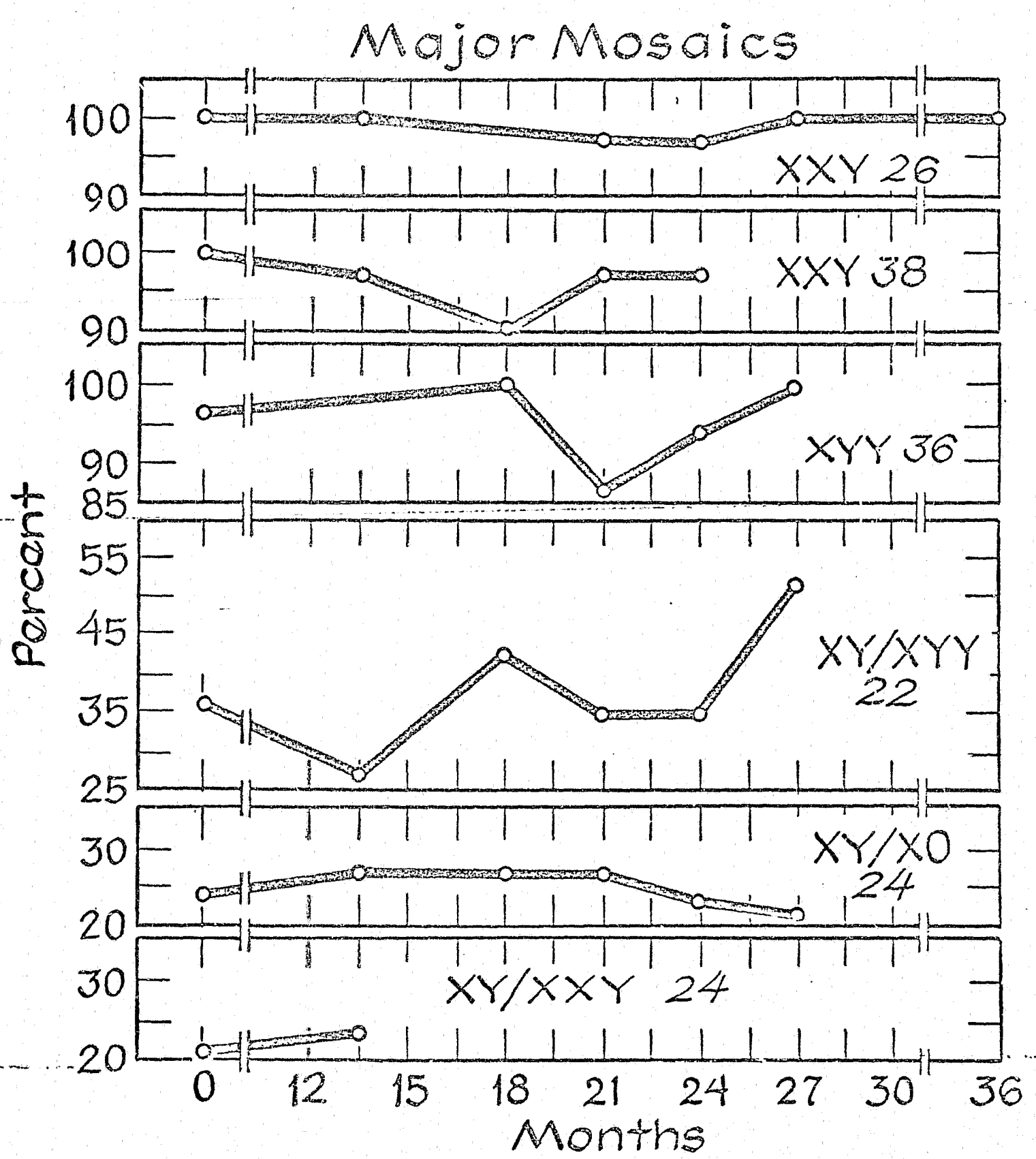
Major Mosaics
Percent
100
90
XXY 26
100
90
XXY 38
100
90
XYY 36
85
55
45
35
25
XY/XYY
22
30
20
XY/XO
24
30
20
XY/XXY 24
0
12
15
18
21
24
27
30
36
Months

FIGURE II A

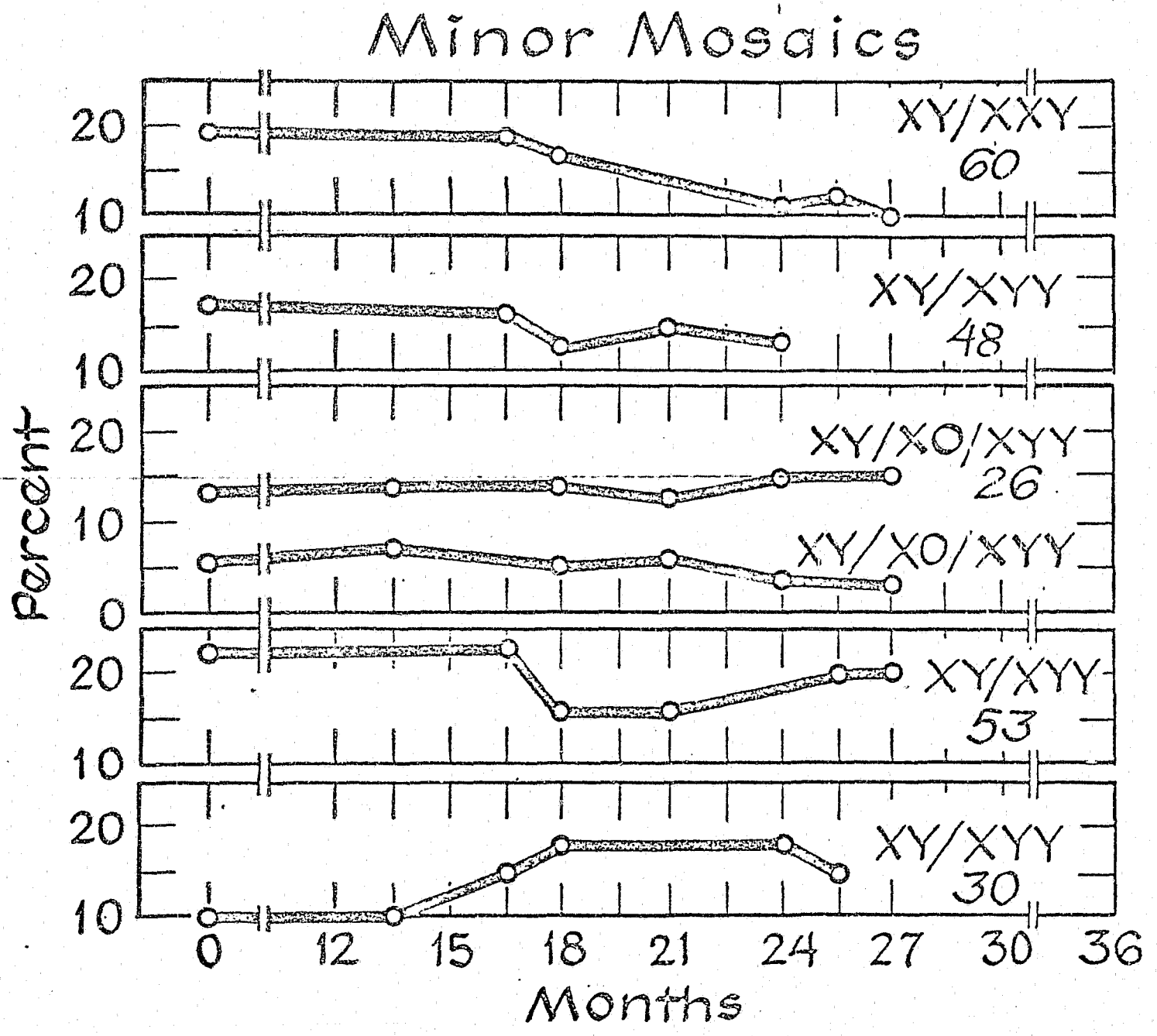

FIGURE II B

Karyotypic progress

Note that the first case XY/XXY age 60, appears to be decreasing the proportion of aneuploid cells in the blood.

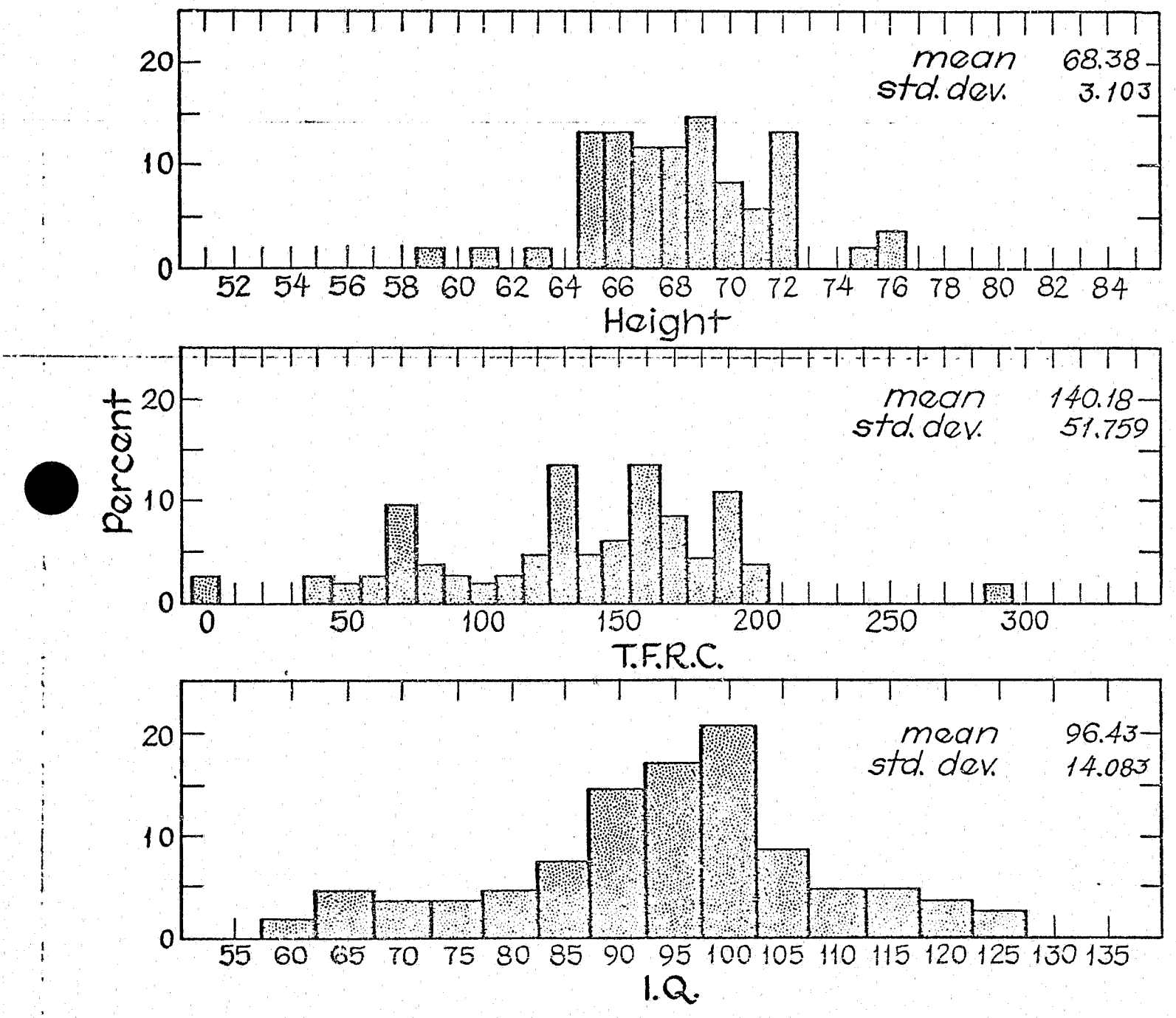
mean 68.38
std. dev. 3.103
20
10
0
52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84
Height
Percent
mean 140.18
std. dev. 51.759
20
10
0
0 50 100 150 200 250 300
T.F.R.C.
mean 96.43
std. dev. 14.083
20
10
0
55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135
I.Q.

FIGURE III

TABLE I

Mosaic Detection

Where:

p = minor mode, b = probability of missing minor mode,

n = number of cells counted

	p = 0.05	.1	.2	.3	.4	.5
n	b	b	b	b	b	b
2	.91	.82	.68	.58	.52	.50
10	.59	.35	.11	.03	.006	---
20	.35	.12	.01	.001	-----	---
30	.21	.04	.001	-----	-----	---

CONTINUED

3 OF 4

TABLE II

CHROMOSOMES: MAJOR CASES

(6 samples over 3 years)

Karyotype	% cells affected	Height	I.Q.	Other
XXY	100	5'5"	67	Sm. genitalia but fertil
XXY	100	6'5"	69	Testicular
XYY	100	5'5"	97	Normal
t(A2q-A1q+)	100	5'7"	117	Normal
XY/XXY	>20	6'1"	120	Normal
XY/XYY	>20	5'6"	118	Normal
XY/XO	>20	5'8"	75	Normal

X anomalies - 3; Y anomalies - 2; Other - 2

CHROMOSOMES: MINOR CASES

(6 samples over 3 years)

Karyotype	% cells affected	Height	I.Q.	Other
XY/XO/XXY	<20	5'7"	110	Normal
XY/XYY	<20	5'7"	110	Normal
XY/XYY	<20	5'11"	79	Normal
XY/XYY	<20	5'4"	107	Normal
XY/XXY	<20	5'6"	98	Normal

X anomalies - 2; Y anomalies - 3

TABLE IIIA

FINGER-PRINTS

	Total Finger Ridge-Counts			
	Sex Chromosomes			
	Loss	Normal		Excess
	XO	XY	XX	XXY or XYY
Non-penitentiary	169	148	127	118
Sexual offenders				
Chromosomes normal		145		
Full aneuploidies				49
Major mosaics				95
Minor mosaics				131

TABLE IIIB

	Average Values Correlated With Chromosomal Constitution				All inmates	Cases 1-12 (except 6)	100% 1-3 XXY XXY XYY	% cells affected >20 <100 1-5 XY/XXY XY/XYY	<20 8-12 XY/XO/XXY XY/XYY XY/XYY XY/XXY XY/XXY	6 XY/XO
	XO	XY	XX	XXY						
Fingertips										
Mean total finger ridge-count	169.3	147.5	127	117.8	140.2	112.8	48.6	94.9	130.8	291
% fingers with UL	68.1	61.5	65.6	61.3	53.8	56	50	48	58	100
RL	4.1	5.9	4.8	5.8	4.3	7	7	8	6	0
W	25.8	28.3	23.9	25.4	35.5	24	10	22	22	0
A	2.0	4.3	5.7	7.5	4.3	13	33	22	4	0

RATE OF CHROMOSOMAL CHANGE IN CRIMINAL POPULATIONS

L. Razavi, M.D., M.P.H.

In many people's minds there still remains some uncertainty about the true nature of the relationship between chromosomal abnormalities and crime. Some of the confusion arises from the interrelation of intellectual deficiency and crime, the particular role of the Y chromosome, and the belief that chromosomal constitution is stable; and I am going to discuss these points as they apply to the relationship of sex chromosomal abnormality and sex crime. I am not going to discuss autosomes or non-sexual crime.

The original observations of an association between insane criminals and chromosomal aberration were made without any particular hypothesis in mind, but under the universal expectation that intellectual deficiency would be an inevitable complication of the malformations caused by chromosomal abnormality. This is because of the sensitivity of the brain to embryological disturbances. And then, cases with the first human chromosomal abnormality discovered, mongolism, were usually committed to mental institutions at some time in their lives, so that in order to learn more about chromosomal disease it was thought the best way to locate more material was by screening mental institutions. Some of these contained ineducable criminals, and some of these criminals had odd chromosomes.

The result was, therefore, that criminals with chromosomal anomalies were found not so much because they were criminal but because they were mentally deficient. Quite rightly at this stage it was supposed that crime was a secondary effect of intellectual incapacity and the complexity of modern life not a special result of chromosomal disorder.

At the same time it was being discovered elsewhere, in hospitals and new-born nurseries, that chromosomal malformations of several different types could be distinguished one from the other, and that these were "caused" by certain chromosomes only. It was discovered that many babies with these diseases

died in infancy, unless only a portion of their body's cells were affected. However, odd sex chromosomes were much less likely to cause death than others: indeed many chromosomal intersexes were only manifest clinically at puberty because the particular cells affected interfered with secondary sexual maturation rather than primary genital formation; and others grew into full adult life with only one or two clinical defects which might have brought them to the attention of families or service doctors, or made them seek out help themselves.

In the younger patients the problems were nearly always concerned with infertility or poor physique in adolescence. For instance, 30% or more of women who never menstruated had abnormal sex chromosomes. In the older group sexual neuroses and social maladjustment also appeared as a problem needing attention. On the other hand these people were making some sort of headway in school, the services and society at large. That is, they were not intellectually defective to such a degree as to have been in obvious need of institutionalization. But they were not finding life easy.

From chromosome studies outside mental institutions it seemed, then, that sex chromosomal disorders were commoner, because less lethal, than others; that their effects might be confined to few physical characteristics and that these cases were most easily found in certain special populations with brain or (physical) sexual disorder. These might only make their appearance felt (or become a "disease") a long time after birth. Into this category also fell the unusual stature of some inmates with the notorious YY Syndrome. Presumably there were other people in whom such a small or insignificant portion of the body was affected that it never had any practical importance whatever and was never noticed. To all intents and purposes this is just as normal as having all cells with correct chromosomes.

We therefore arrive at the notion of focal chromosome abnormalities whose local effects may be as trivial as the focal malformations of a vestigial tail seen only on X-ray or as important as a septal defect in the heart. It depends on the site at which they occur, the number of cells affected, and the time they are called into action.

With respect to cerebral function and sex chromosomes clinical experience supported this conjecture; often cases seen by endocrinologists, gynecologists, and psychiatrists were intellectually above and below normality with the same frequency as the general population.

The conclusion was reached therefore that sex chromosomal abnormalities were not inevitably associated with mental deficiency or gross anatomical malformation, but rather often had circumscribed sexual problems of physiological function or emotional orientation. What gave importance to this conclusion was that it was always known, but unexplained, that these people had a history of difficult behavior partly because of habitual tendencies to thwart authority and rules designed for others, in school or job; and partly because their sexual outlook put them outside the accepted norms of social manners. Brief reflection makes this hardly surprising, whether palatable or not.

I decided to investigate this aspect of human chromosomal character anew, this time confining myself to sex chromosomes, setting up a specific hypothesis and testing it rigorously under conditions which allow a clearer decision on the association of sexual crime and sexual aneuploidy. I also wanted to test methods of increasing the efficiency of chromosome surveys, which are expensive and time consuming, by confining my cytological work to those whose fingerprints were characteristic of sexual discordance. This derives from the fact that there are average differences in fingerprint character

between men and women and these are reflected in sex chromosomal abnormalities. The most useful of these are the total finger ridge count and the frequency of arch patterns. An ectodermal marker would also be interesting because it would be embryologically closer to neural tissues than lateral plate mesoderm, the source of lymphocytes usually tested.

The formal hypothesis was this: a priori it may be expected that those with sex chromosomal disorder will have problems of a specifically sexual nature; that these will cause most disturbance in parts of the body particularly dependent on sex chromosomal balance; but that the outcome will depend on the proportion of cells affected and the times in life when they are required to function physiologically.

The most suitable epidemiological test of this that I could find was a group of adult males whose sexual problems had run them afoul of the law. They had, however, no intellectual or physical defects bringing them to medical notice nor any evidence that their sexual psycopathy was really a mentally defective response to seeing themselves with an intersexual physique. They were in fact normal externally and intellectually. In other words, the ascertainment was socio-legal and independent of biological character.

It is implicit in this theory that sexual behavior is modified by time and dependent on environment: therefore, no test is being made which denies the role of social experience. It only isolates the biological component of behavior in a way that allows its association with crime to be tested logically -- by treating one of two interdependent variables (nature versus nurture) in circumstances where it is very largely independent. Beyond this the notion of experience is thought of in terms of biological chronology so that the interaction of body and upbringing can be conceived of dynamically on both sides. As a first step in the direction of measuring the rate of biological experience I did serial chromosome tests on the same individuals over several years.

I found about 10% of the sexual criminals have sex chromosomal abnormality

(fifty times the rate in new-borns). There are about equal numbers of X and Y anomalies and half the cases are partially affected. In some the proportion remains stable; in others it changes so that the number of affected cells decreases or increases as time goes by. The maximum rate of change appears to be close to 1% cells per month but this is a most tentative estimate because of factors I will describe with my slides. I did not find any seasonal effect.

Later with Dr. Loren Roth and Dr. Frank Ervin I reversed the procedure at another penitentiary. Instead of picking sexual offenders for chromosome testing, I picked those with characteristic FBI fingerprints without knowing their crime or health. We found that both sexual crime and sex chromosomal anomalies were commoner among those with odd fingerprints, and that the rate of chromosomal anomaly was again about 10%. However, a fifth (20%) of those with odd fingerprints had abnormal chromosomes. So it would have been possible to do tests on roughly half the group, and come up with double the rate of chromosome abnormalities - a very efficient improvement in the cost of chromosome testing which is expensive and time consuming.

Even without a matched adult control population, a fifty fold excess over infants seems hard to argue with and our conclusions are that sex chromosomal abnormalities can be a part of sexual misbehavior without the intervention of overt physical and mental deficiency; that X and Y chromosomes equally contribute; and that some of the confusion about chromosomes and crime can be modified by considering the body as a complex of many tissues and their chromosomes which change over time. Thus a negative association of chromosomal anomaly and crime must allow for the possibility that there is too small a proportion of cells to be detected at the time of sampling. A positive association between blood cell aneuploidy and misbehavior still makes the assumption that blood is a good representative of other tissues, again, at the time of sampling. Secondly, we can confine chromosome history to a group most likely to yield positive results, by screening fingerprints first. Of course this does not mean we will find <u>all</u> people with odd chromosomes

this way, nor that all people with odd fingerprints have abnormal blood cells. The reasons for this must be clear from what has already been said. What we have gained here is a greater ease of finding cases carrying the highest risk.

I would think that changes in blood cells are an exaggeration of the possible changes elsewhere, because blood is a high turn-over tissue; but I conjecture that neuro-endocrine tissues in which function and growth are very much age-dependent or cyclical are a rather suitable candidate for the source of the curious facts that usually sexual crime is committed after puberty and before the age of forty, and violent crime often has a periodic or cyclical concomitant of changes in mood. I also suspect that small mistakes in chromosomal character may be commoner than was formerly believed; indeed there is a theory that variation in the structure of chromosomes is now considered as a source of certain types of normal differentiation.

The essence of chromosomal disorder therefore is that it prevents tissues from behaving maturely by interfering with differential growth rates and migration in the embryo, as well as function in the adult. In this sense it can be regarded in the same light as other agents which cause dysmaturity such as German measles virus. The aim here is to develop the idea of organ specific chromosomal evolution in the brain with the sociological concept of an evolving civility as these both influence human behavior.

FIGURE II A

Karyotypic progress

Note that in case 4 (XY/XYY aged 22) the proportion of aneuploid cells, is increasing, while case 1 (XXY aged 26) remains stable. In general a mosaic case may be defined primarily as an unstable aneuploid in whom the rate of production of aneuploid cells varies over time. Full aneuploids on the other hand maintain an apparently stable population in which observed variation is satisfactorily attributable to sampling error. We may expect the risk of cancer to be highest in the unstable case.

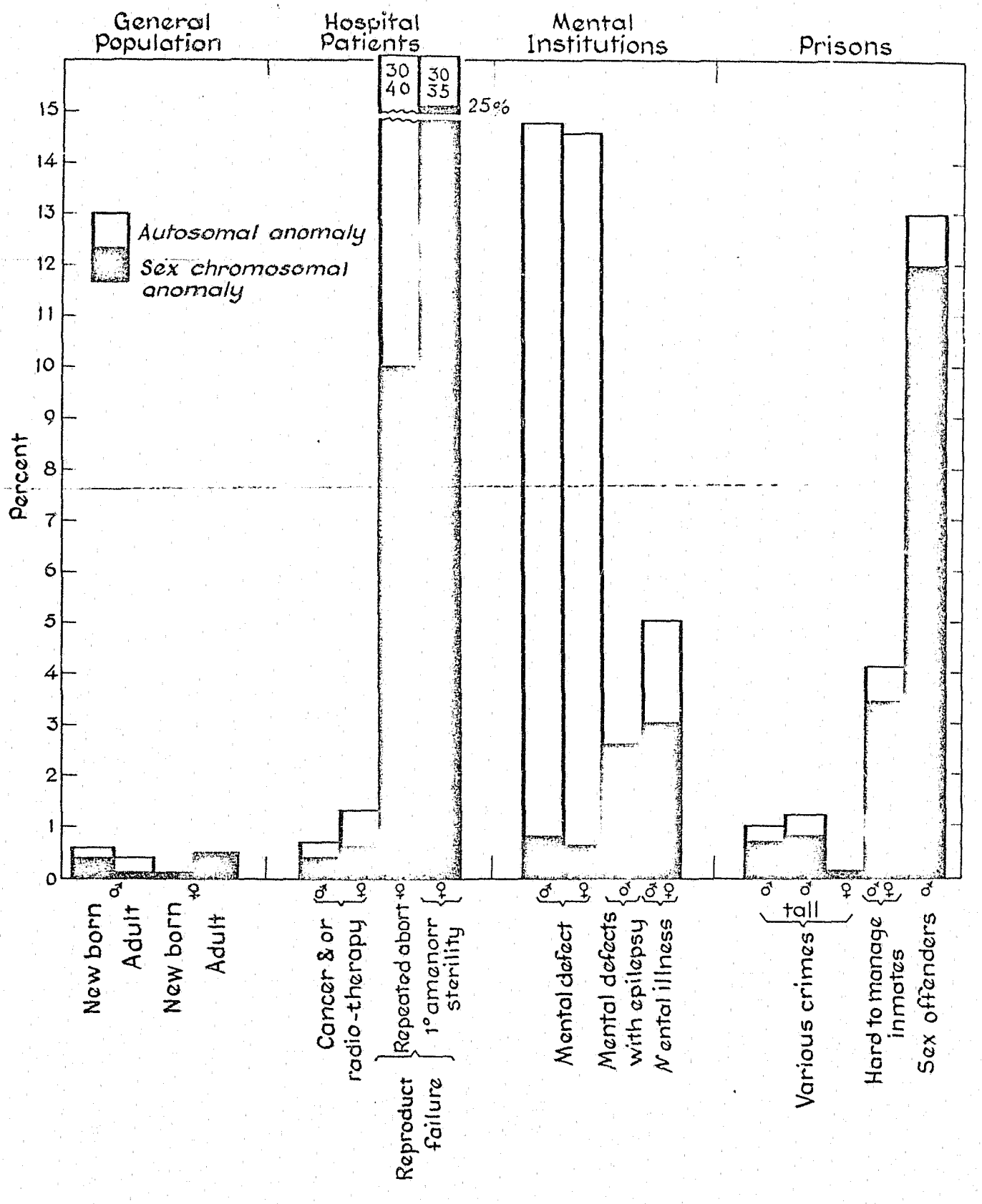
General Population
Hospital Patients
Mental Institutions
Prisons
30 40
30 35
25%
Autosomal anomaly
Sex chromosomal anomaly
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
New born ♂
Adult
New born ♀
Adult
Cancer & or radio-therapy
Repeated abort ♀
1° amenorr sterility
Reproduct failure
Mental defect
Mental defects with epilepsy
Mental illness
tall
Various crimes
Hard to manage inmates
Sex offenders

FIGURE I

FIGURE II A

Karyotypic progress

Note that in case 4 (XY/XYY aged 22) the proportion of aneuploid cells, is increasing, while case 1 (XXY aged 26) remains stable. In general a mosaic case may be defined primarily as an unstable aneuploid in whom the rate of production of aneuploid cells varies over time. Full aneuploids on the other hand maintain an apparently stable population in which observed variation is satisfactorily attributable to sampling error. We may expect the risk of cancer to be highest in the unstable case.

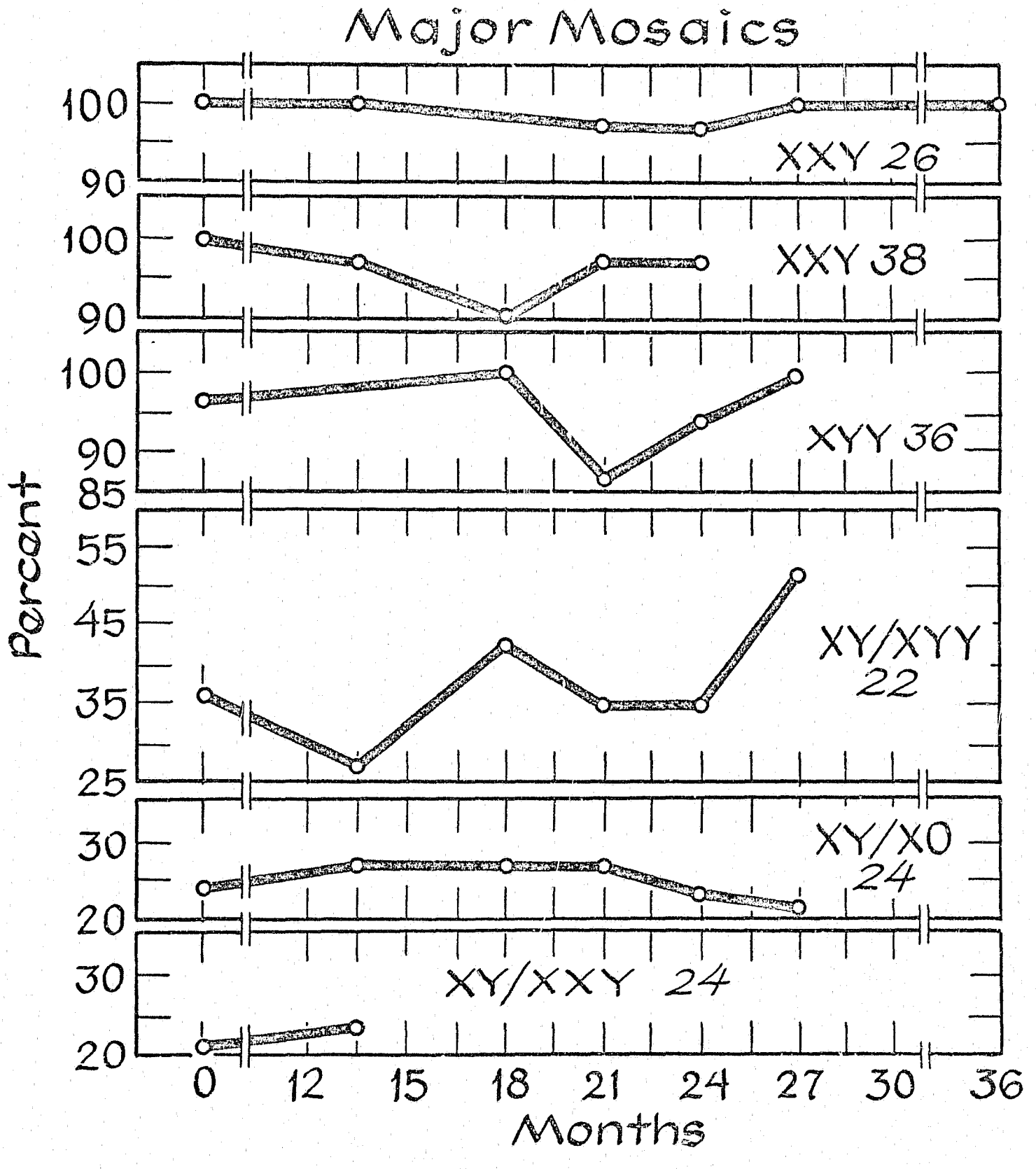
Major Mosaics
Percent
100
90
XXY 26
100
90
XXY 38
100
90
85
XYY 36
55
45
35
25
XY/XYY
22
30
20
XY/XO
24
30
20
XY/XXY 24
0
12
15
18
21
24
27
30
36
Months

FIGURE II A

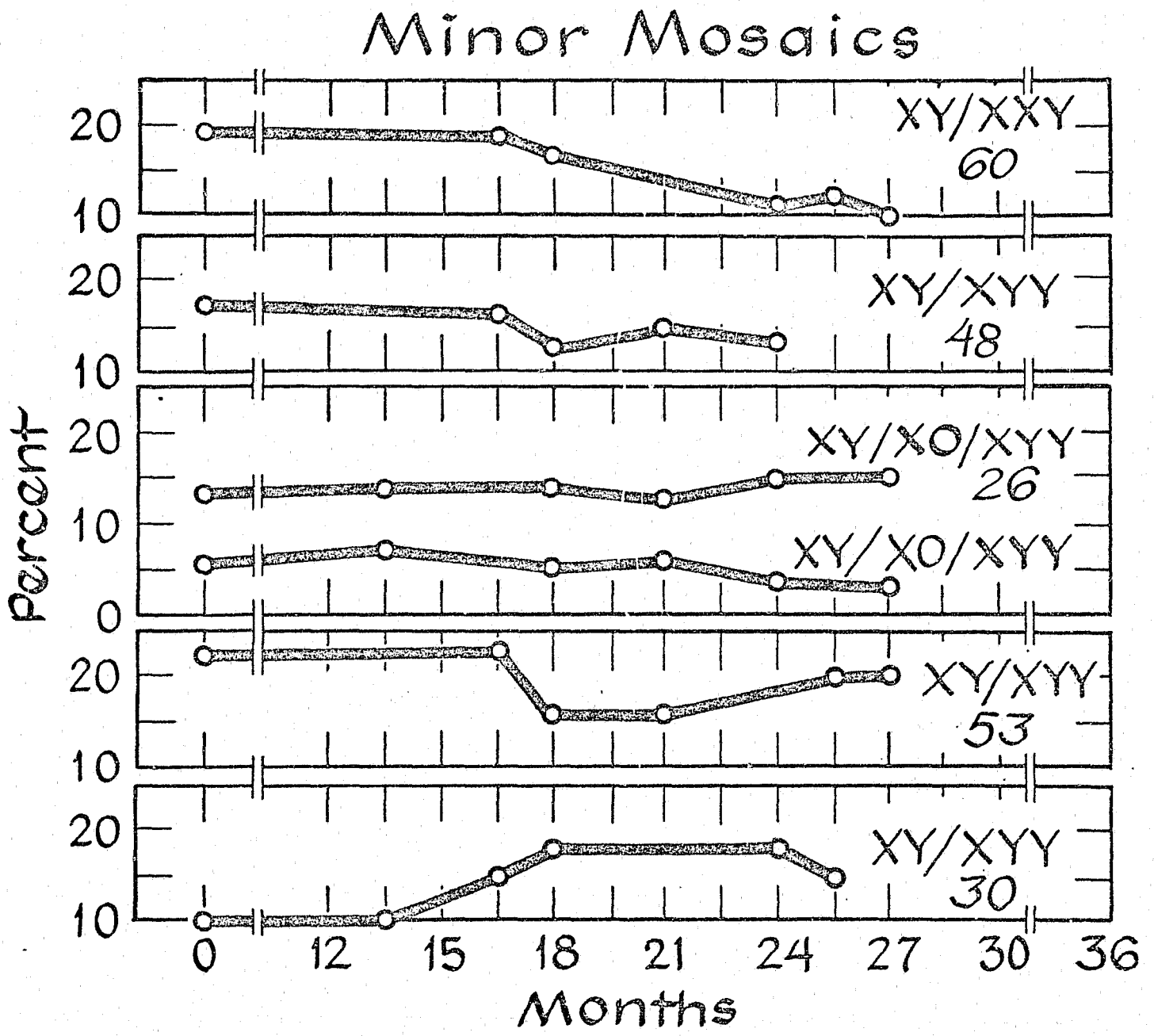

FIGURE II B

Karyotypic progress

Note that the first case XY/XXY age 60, appears to be decreasing the proportion of aneu loid cell- in t-

PSYCHIATRIC CARE OF FEDERAL PRISONERS

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INTRODUCTION:

In 1927 Karl Menninger recommended certain psychiatric services as indispensable to criminology: a psychiatrist available to every court; psychiatric report before sentence of any felon; a psychiatric service in every correctional institution; psychiatric report on felons before release. These recommendations have never been met. Psychiatric involvement with the ordinary offender continues to be uncertain. It is still not known to what extent psychiatrists are evaluating, interviewing, or attempting to treat offenders. Also, save for outstanding efforts by the St. Louis group, there have been few recent attempts to assess psychiatric morbidity in criminal populations. (2) (3). This study attempts to remedy these deficits, and also to provide new information relating psychiatric care of offenders to social class and to violent behavior.

METHODS:

Convicted Federal prisoners are accompanied to jail by a pre-sentence report, composed by a Federal probation officer. These reports are thorough, 6 to 15 pages, and document the inmates' criminal, social, military, occupational, and psychiatric history. It is the responsibility of the probation officer to verify the history as objectively as possible. In addition, each inmate accumulates current prison psychiatric, medical, and psychological records.

This study is a retrospective review of all of these records for all the men who were incarcerated at Lewisburg on January 1, 1969, omitting only those men who were released during the time necessary to review this volume of records. We attempted to survey the records of 1240 men and actually completed records on 1154 men. From the records a notation was made for each man of every psychiatric contact, whether it was a history of state hospitalization, visit to a private psychiatrist, competency-to-stand-trial report, etc. Routine visits to the prison psychiatrist for medication were not counted but any record of formal treatment in which a treatment summary or diagnostic report was written, including reports from group therapy, was counted. For each contact was noted: the date, whether or not it was a criminal contact, the referring source, the place of care or disposition, the diagnosis, and the profession of the psychiatric contact

(psychiatrist or psychologist). All contacts were recorded, including those made years ago as a juvenile, or in another prison, or in this prison, etc. The study is thus a record of the lifetime incidence of psychiatric contacts and illness of the studied men.

The Setting

The Federal penitentiary, Lewisberg, is a medium security all male institution housing young and middle aged confirmed offenders. Average age of the studied population was 33.4 years. 37% of the men were members of minority groups. Present grade achievement, on average, was sixth grade. Social class (Hollingshead) was 6%, Class 1, 2, or 3; 28% Class 4; 67% Class 5. 71% of men were presently sentenced for crimes against property, 29% for crimes against person. Less than 2% were sentenced for traditional Federal crimes like income tax violation, espionage, liquor law violations. 70% had at some time in their history at least one conviction for an offense of violence and approximately 10% had a history of sexual offenses. The population, despite being Federal inmates, resembled demographically, men incarcerated in state institutions.

The Records

We refer to two types of psychiatric contacts. Non-criminal contacts are those occurring independently of the criminal process, i.e., voluntary visits to private psychiatrists or clinics, voluntary or civil commitments to state hospitals, voluntary admissions to Federal Drug hospitals, etc. Criminal contacts include court ordered psychiatric examinations, pre-trial hearings for observation or competency, and other in-prison exams.

All diagnoses recorded were those given in the records, save that we classified diagnoses into the usual categories: e.g. conversion reactions -- neurosis; schizophrenia -- psychosis; sociopath -- personality disorder.

A man was considered epileptic if he had been declared so at least once by report of a medical physician -- either previously or by the penitentiary physicians who routinely examine each inmate. In most cases this meant that either the man had "epilepsy" and an abnormal EEG in the record, or he had

had a seizure witnessed by medical personnel.

A man was considered alcoholic if: 1) he had received this diagnosis by report of a medical physician, or 2) if he had been declared "alcoholic" and recommended to attend prison A.A. by the prison "treatment team", education, vocational, and psychology personnel who review the inmate's social records and attempt to establish a prison treatment plan.

Reviewer Reliability

Since a great bulk of records, scattered throughout the penitentiary, were reviewed by one person, a validity check was done. Several months after the study was begun, 100 records were re-read and compared with the previous review on such parameters as length of sentence, dates of arrest, and psychiatric diagnoses. The records were read within a 3% margin of accuracy, an error felt acceptable.

RESULTS:

Results are given in Tables 1-6. In all cases the tables indicate whether or not a man has been seen psychiatrically, at least once, in any given setting, or if he has received, at least once, any diagnosis. In Tables 2 and 3 the percentage of men ever seen is less than the combined in-patient and out-patient percentages because some men were seen in both settings. Table 5 compares age of psychiatric contacts to points in criminal careers and Table 6 relates psychiatric contacts to social class.

DISCUSSION:

The data can be viewed as a sort of mental health report for these offenders. We do not argue that the men are presently in jail because of mental illness, nor that mental illness is the cause of most crime. This thesis was pursued unsuccessfully early in the century. (4) (5). In these studies, one quarter to one third of criminals were found to be mental defectives. This work was not subsequently borne out. (6) The same has been the history of the thesis that criminality is related to schizophrenia. Recently published work has shown no increase in schizophrenia in unselected criminal populations over

that found in the general population. (2) (7) (8).

It must be stressed that our data is of the prevalence type in a selected population. All the men studied were residents of Lewisberg at a fixed point in time. Although the average inmate in the study had been incarcerated for almost two and one-half years on his present sentence, a minority had already served terms of many years. Some of these men may have been retained within the prison system because of their psychic instability or their potentiality for violence, two of the parameters that we were attempting to study. Our study, therefore, should be regarded as a background for evaluating past, and planning for future, mental health interventions for these men. We also feel that characterizing a population in this manner is a necessary step towards understanding the prison milieu, an area still largely unexplored by psychiatry.

The data on psychiatric contacts, especially the contacts occurring in a context unrelated to legal matters gives some estimate of the degree of psychiatric morbidity in the population. Figures of special note are that 18% of the men have had in the past at least one non-criminal psychiatric contact, and 10% of the men have had at least one previous psychiatric hospitalization, unrelated to criminal activity. The figure of 18%, as an estimate of probable mental disease in the population, compares well with the other, older, figures from the literature. Bromberg reviewed 10,000 consecutive admissions to the Psychiatric Clinic of the General Court of Sessions of New York in 1937-38 and found 18% of men convicted of a felony psychiatrically "abnormal". (6) Guttmacher, in 1958, cited a figure of 20% of inmates psychiatrically abnormal. (9) The figures from California are lower. Ernest and Keating note that 10% of California felons are "suffering from emotional illness of such degree as to preclude their adequately adapting to normal institutional regime", i.e., needing special observation or containment at a prison medical facility. (10)

Figures to compare from general populations are difficult to find. Both the Midtown Manhattan and the Stirling County studies concluded that one-fourth to one-fifth of the general population suffered from moderate to severe psychiatric pathology, but most of these probably "sick" people had never had psychiatric contacts. (11) (12). Kramer, using the case register

method, calculated that 18% of infants born in Maryland in 1960 can be expected to have contact with at least one psychiatric facility over their lifetimes. (13) Kramer's figure of 18% incidence of life time contacts for a normal population can be compared with our figure of 18% of men ever with a history of non-criminal contacts. Our figure of 18% will probably climb in future years, however, since the average age of the Lewisberg men is 33 years, and they have another approximately 33 years remaining before their lifetimes are complete. The comparative figures do show that psychiatric exposure to past and future criminals is occurring, to at least the same degree, probably greater, than is present in the general population.

We think it is impressive that at least half of the Lewisberg men have had some type of psychiatric evaluation in conjunction with criminal activity. But after incarceration begins, psychiatric contact with inmates plummets. Only 13% of the men have ever been seen, even once, any time after their admission to prisons, and most of these men have had multiple incarcerations. More than two-thirds of the offenders ever seen were seen for purposes of observation, to assess competency or responsibility, while reports of attempted psychiatric treatment (exclusive of those men hospitalized psychiatrically in prison) are present for less than 1% of inmates seen. This figure of 1% may be higher since inmates are seen in group therapies where it is the policy that no reports be written by observing staff but it is probably no greater than 10%. Our data thus complements the valuable study of Scheidemandel and Kanno who found that while 5% of all residents of mental hospitals are public offenders, only 4% of this 5% is hospitalized because of being not guilty by reason of insanity. (14) Their data and ours emphasize that the bulk of psychiatric expertise in criminology is being exercised in a limited area, the pre-trial evaluation of the offender. One psychologist or one psychiatrist working alone with 1000-plus men can not give individual attention to very many.

The data also show that biologic factors associated with criminality and/or violence, have not been adequately evaluated. A large percentage of men having EEG's had abnormal or borderline abnormal recordings (50%), but only 5% of all inmates had ever had an EEG, available to prison authorities. Since it has been shown that repetitive violence is associated with EEG abnormality, this is an area where further evaluation, even before treat-

ment, is needed. (15) 3% of the men also had "spells" which we were unable to further classify, though these men would be prime candidates for a "dyscontrol" syndrome requiring psycho-biologic investigation.

The data on diagnoses is of interest, but we are cognizant that the diagnoses were made over many years, by different men, over all parts of the country, using differing criteria. The high degree of alcoholism and drug abuse corresponds to other studies and should be undisputed. (2) Epilepsy is over-represented by 5 times the normal prevalence, but retardation, accepting the figure of 3% diagnosed retarded, equals normal prevalence. (16) Psychoses, especially schizophrenia, appear over-represented. Our figure of 6% ever diagnosed schizophrenia is several times the accepted lifetime incidence figure of less than 1%. (17) This may be so because our study documents first psychoses with onset in prison (4% of all men had such a psychosis, usually of schizophrenic type) which are not included in other studies already cited. Also our study is a partial lifetime incidence since any history of a diagnosis of schizophrenia was counted as opposed to the one point prevalence method of others who have surveyed criminal populations. Finally our population is composed of recidivists whose long sentences cause them to accumulate in high security penitentiaries, just as do chronic schizophrenics in state hospitals. It is possible that these men more frequently manifest a thought disorder than would an unselected criminal population, perhaps uncovered by long exposure to an environment of sensory deprivation or justified paranoia. The impact of this high percentage of disturbed men on prison rehabilitation programs would be a fruitful area for inquiry.

The data on psychiatric contacts in relation to violent behavior shows that psychiatrists are evaluating and treating disturbed individuals, who later go on to commit violent acts even though they have not done so previously. The figures for non-criminal contacts are relatively small (12% of men seen prior to conviction for a violent act) but this figure climbs to better than 25% when criminal evaluations are included. Prospective studies of juvenile offenders seem warranted in order that predictive scales be developed and interventions be made prior to the onset of the violent behavior.

The data on social class extends the observations of Hollingshead and Redlich to criminal psychiatry. (18) We were surprised by the results, expecting to find the opposite. We thought it more likely that members of the

higher social classes would have a history of psychiatric contact of a non-criminal nature prior to their criminal career. There are too few men in Class 1 and 2 to test this hypothesis, but in the other three classes, non-criminal psychiatric contacts are equally frequent. This is not so for criminal contacts, however, where, similar to Hollingshead and Redlich, the lowest social class, V, includes the greatest percentage of men ever seen. We again had expected the opposite would be so, reasoning that the legal and psychiatric profession would be more likely puzzled by the criminal acts of the more well-to-do, those more their peers, and would thus order a psychiatric examination. The same bias might be expected to extend to treatment within the criminal context. There are several possible explanations for the findings. Psychiatric contacts may correlate most strongly with type of crime committed, and if the lower classes commit more violent crime, as recent studies show, then they might be expected to have more criminal psychiatric contacts. Against this as sole explanation of the data is our figure, not reported in the tables, of 51% of violent men ever seen psychiatrically compared to 46% of non-violent men, an insignificant difference. This might mean that genuine psychiatric illness is more frequently found in criminals of lower class background, or that the behavior of men of the lower class seems so strange to the correctional apparatus, that more exams are being ordered, or that examinations performed on members of lower social class are more frequently retained in the inmates' legal records.

END OF DISCUSSION

CONCLUSIONS:

1. Review of all past and present criminal, social, medical, psychiatric, and psychologic records of almost 1200 incarcerated Federal prisoners was performed.

2. Even excluding all psychiatric contacts occurring within a criminal context (i.e., pre-trial, in prison) 18% of the men have had at least one psychiatric encounter. 12% have had out-patient contacts and 10% have had psychiatric hospitalization.

3. Including criminal contacts 18% of the men have had some type of psychiatric hospitalization. Review of relevant literature, plus these figures indicate

that psychiatric morbidity in criminal populations is probably somewhere between 15 and 20%.

4. Although a large number of inmates have at some time been seen psychiatrically in conjunction with a criminal charge or during a prison term (50%), most of these contacts occur at the pre-trial or immediate post-trial stage. Very few inmates are ever seen again, specifically within a treatment context.

5. Compared to normal populations, alcoholism, drug abuse, epilepsy and schizophrenia are over-represented within the prison.

6. 4% of the population has suffered a first psychosis while incarcerated.

7. Considering the increasing evidence for biologic defects among chronic offenders, only a small number of men have ever had an EEG; or at least one which is available to prison authorities. (5%).

8. Relatively small percentages of men have ever been seen by psychiatrists prior to their ages of first arrest, first violent arrest, or first violent conviction. Including prison contacts, however, greater than one-fourth of violent offenders have been seen psychiatrically prior to their first violent conviction. More effort and expenditure should be devoted towards psychiatric evaluation and treatment of the convicted offender as this may be an efficient method of screening for and preventing future violence.

9. Offenders from the lowest social class (5) are significantly more likely to have been seen psychiatrically than are offenders from class 3 and 4. This data extends the data of Hollingshead and Redlich to a criminal population.

10. This data, some of which has been hitherto unavailable, should be of use in planning future psychiatric interventions for criminal populations.

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PSYCHIATRIC CONTACTS CRIMINAL AND NON-CRIMINAL COMBINED

(N=1154 MEN)

1.	EVER SEEN	56%
2.	? NEVER SEEN	44%
3.	PSYCH. HOSPITALIZATION	18%
4.	OUT-PATIENT EVALUATION	17%

Table 1.

NON-CRIMINAL PSYCHIATRIC CONTACTS

(N=1154 MEN)

1. EVER SEEN 18%

2. OUT-PATIENT 12%

   a. MILITARY 50%
      PRIVATE 25%
      OTHER 25%

3. HOSPITALIZED 10%

   a. STATE HOSPITAL 40%
      MILITARY HOSPITAL 20%
      FEDERAL DRUG 20%
      PRIVATE 20%

a. % Of those men seen

Table 2.

CRIMINAL PSYCHIATRIC CONTACTS

(N=1154 Men)

1.	EVER SEEN		50%
2.	OUT-PATIENT		8%
3.	CIVIL HOSPITAL		13%
a.	STATE HOSPITAL	77%	
	FEDERAL DRUG HOSPITAL	23%	
4.	EVER SEEN IN LEGAL CUSTODY		43%
5.	EVER SEEN POST ADMISSION TO PRISON		13%
6.	LEGAL CUSTODY		
	1. OBSERVATION, COMPETENCY, RESPONSIBILITY		64%
	2. CLASSIFICATION		45%
	3. PRISON OUT-PATIENT (E.G. PRE-PAROLE)		17%
a,b	4. PRISON IN-PATIENT TREATMENT		12%
	5. SPECIAL OBSERVATION (FEDERAL CENTER FOR PRISONERS, ST. ELIZABETH HOSPITAL)		9%
	6. PRISON OUT-PATIENT TREATMENT		1%

a. % of those men seen

b. Total is greater than 100%, since a man may have been seen for more than one purpose while in prison.

Table 3

DIAGNOSES ALL SOURCES

(N=1154 MEN)

	1.	PERSONALITY	31%
	2.	ALCOHOLISM	29%
a.	3.	DRUGS (ANY)	25%
	4.	DRUGS (HEROIN)	18%
	5.	PSYCHOSES (ANY)	8%
	b.	SCHIZOPHRENIA	75%
		OTHER	25%
	6.	NEUROSES	6%
	7.	NO DISORDER	6%
	8.	RETARDED	3%
		? RETARDED	5%
	9.	EPILEPTIC	2%
	10.	INCOMPETENT	1%

SPECIAL CATEGORY

1.	SUICIDE ATTEMPTS	8%
2.	PRISON PSYCHOSES	4%
3.	EEG (ANY)	5%
4.	EEG (ABNORMAL)	2.5%

a. %'s total more than 100%, since a man may have received more than one diagnosis.

b. % of those ever diagnosed (psychotic).

Table 4.

PSYCHIATRIC CONTACTS AND VIOLENCE [a]

(N= 826 MEN)

NON-CRIMINAL CONTACTS	
1. PRIOR TO 1st ARREST	5%
2. PRIOR TO 1st VIOLENT ARREST	6%
3. PRIOR TO 1st VIOLENT CONVICTION	12%
CRIMINAL CONTACTS	
1. PRIOR TO 1st VIOLENT ARREST	7%
2. PRIOR TO 1st VIOLENT CONVICTION	18%
COMBINED DATA	
1. PRIOR TO 1st VIOLENT ARREST	12%
2. PRIOR TO 1st VIOLENT CONVICTION	26%

[a]. A man was considered violent if he ever had in his criminal record a history of conviction for assault, robbery, murder, rape, or kidnapping.

Table 5.

SOCIAL CLASS IN RELATION TO PSYCHIATRIC CONTACT [a]

(N=1154 MEN)

	CLASS 3	CLASS 4	CLASS 5
Percent of class having any history of psychiatric contact	27.3%	42.6%	*52.8%
Percent of class having history of non-criminal contact	15.9%	15.7%	17.5%
Percent of class having history of criminal contact	22.7%	38.2%	46.6%

[a] . Unfortunately, there were so few men in class 1 and 2 (4 and 8 men respectively) that it seems premature to include figures for these classes. They are therefore omitted.

*Signficant at .05 level - Chi Square

Table 6.

VIOLENT AND NON-VIOLENT PRISONERS, A COMPARISON # 1

Loren H. Roth M.D.
Lawrence Kazavi M.D., M.P.H.
Ann M. Rollins M.A.
Frank R. Ervin M.D.

INTRODUCTION:

Criminality and violence, though incompletely understood, are subjects of intensive public and research interest. Recent valuableworks of a summary nature have been contributed by the Robbins group(1,2) and by the Staff Reports of the National Commission on the Causes and Prevention of Violence.(3) These works present a consistent picture. Adult criminality is associated with childhood anti-social behavior disorder, anti-social behavior of father and,to a lesser extent, social class.(1,2) The reports of the President's Commission indicate that criminal violence is to a large degree committed by young males, ages 18 to 24, in urban lower socioeconomic settings, more frequently black than white.(4) But a close reading of this report and a selected review of the literature reveals that there is very little understanding of why personal violence is expressed by some adult criminals and not others. Hare has succinctly summarized the experimental and psychometric data which distinguishes psychopaths from other felons and normals but these findings are nowhere specifically related to criminal violence. (5) Some contributing data is available for murder(6,7,8,9) but we could find only a few controlled studies which compare in any detail the background and characteristics of mainly violent versus non-violent offenders. (10,11,12)

The study reported today addresses this issue. Can differences in social, psychological, or biological characteristics be ascertained when adult recidivistic violent offenders are compared to adult recidivistic non-violent offenders? Is there any continuity between criminality in general and criminal violence, or are these separate phenomena?

METHODOLOGY:

This study is a comparative retrospective review of records for 574 selected male offenders, all of whom were incarcerated at the Federal Penitentiary, Lewisburg, Pa. on Jan.1, 1969. Over a six month period all criminal, medical, social, casework, psychiatric and psychologic records for all of the men in the penitentiary, N=1241, were reviewed and summarized.(L.R.) A description of Lewisburg, the nature and adequacy of these records and the review procedures, and some of the psychiatric findings from the review have been previously presented.(13) Since this presentation, published work of Guze et. al. (14) supports our view that these histories, which include self-reports to caseworkers, as well as F.B.I. records, are relible. Utilizing these records, which had been computer coded on a large number of variables, we designed a study to compare violent and non-violent offenders. In accord with the Violence Commission findings we classified a man as criminally violent if he had

a history of at least one conviction for one of the four "Index" crimes of "Major" violence: homicide, aggravated assault, forced rape, or robbery. To the list we added a few men with convictions for other violence(kidnapping, molestation, or indecent assault.) (See below) 92% of the robberies were listed in the records as "armed." We identified 571 men in the penitentiary who had a history, past or present offense, of these crimes, 217 blacks and 354 whites.[1] Between them these men had committed 896 such crimes, 820 "Index" crimes and 76 others, kidnapping etc. 95 % of these men had had arrests prior to their present crime and 79% had served prior prison terms. Lewisburg is a penitentiary designated mainly for the confirmed offender, though a few inmates are well known political figures.

A non-violent group of inmates was then defined as all men who had no history for conviction for any of the above crimes, nor any history of crimes of"minor" violence, i.e. simple assault or assault and battery. The crimes of these non-violent men are all property offenses, checks, auto theft, burgularly, embezzlement, and a few had a history of non-aggressive sexual crimes, i.e. statutory rape. 287 men were so identified, 71 blacks and 216 whites. 94% of these men had had arrest records prior to their present crime and 74% had served prior prison terms. Despite being non-violent Federal offenders their social origins were similar to other inmates (See below) and confirmed the Violence Commission opinion that Federal offenders, as a group differ little from other criminals. Our previous paper about Lewisburg has also argued that this is so.(13)

We then matched this group of non-violent men to a selected sample of the violent men, matching every man by race and by date of birth to one month. Because it has been shown that recidivistic men commit a very great proportion of all violence (in the Philadelphia cohort study 45% of the sample, recidivists, committed 90% of the violence)(16), and,in order to exclude first violent offenders whose crimes are often of a situational nature, i.e. murder between intimates, we matched non-violent inmates with men who had at least one previous conviction for violence, and who were presently in the penitentiary for some additional crime. 37% of these matched violent men were found to have again committed crimes of "Major" violence on the present offense. This matching procedure had 2 further advantages. We obtained a far greater percentage of men with convictions for aggravated assault, a rare Federal offense, one occurring largely in the pasts of these men. The sample so defined was also largely recidivistic for violence, an average of 1.8 violent convictions per man versus 1.3 offenses per man for the men not studied.

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1. 28 other men, Puerto Ricans, were identified but not further studied because of the small number of this group.

We thus arrived at an age and race matched sample of 574 offenders, half of them the least violent, half of them the most violent men in the penitentiary. Coincidentally the total sample is 50% of all men who had complete record reviews.

These matched samples were then compared on personal factors culled from the literature of crime and violence which we felt to be reliably recorded on the various prison records. Criteria for psychiatric and medical diagnoses on the Lewisburg records have been previously given.(13) Social class of the inmates was computed using the Hollingshead criteria.(17) Education of father was not availabl to us, nor reliably was mother's occupation, so wherever possible we noted occupat. of father, recorded on a scale, 1-7(Hollingshead) as the most reliable indicator of social class of upbringing. Occupations were not available for some fathers, especially absent ones.(See below) Weights and heights presented are those recorded on the day of admission to prison(current sentence). Parent loss was recorded at th time of permanent separation. Institutional violence refers to fights, assaults, forced sodomy etc. occuring during the present sentence. This violence was recorded independently of other criminal records. The meaning of other variables is explained where necessary as a footnote to the tables.

We also performed one new type of observation, not a record review. We inspected and quantified the dermatoglyphics(finger print patterns) of all men from the F.B.I. fingerprint records. Fingerprints were independently reviewed in Boston (Dr. Razavi), the inmate histories in Lewisburg(Dr. Roth). This data, which has previously been shown to be of some utility in thinking about violence is being prepared for separate publication.(18)

All comparisons between the two groups, violent and nonviolent men, were computed separately for each race, and for the entire matched sample. Statistical significance was determined using the Chi Square approximation where percentages are reported, "t" tests, 2 tailed, for numerical data, and where distribution of numerical data was skewed the Mann Whitney U test was employed. Significance is presented at 3 levels, $P. < .05$, $P. < .01$, $P. < .001$.

RESULTS-SAMPLE CHARACTERISTICS:

The matching procedure gave groups of men of virtually identical age; the violent sample is more recidivistic than the non-violent but both are extremly recidivistic:

	BLACKS		WHITES	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)
Age	33.2 ± 7.2	33.4 ± 7.3	35.2 ± 8.8	35.2 ± 9.1
Length Sentence-yrs.	8.9 ± 8.1	5.6 ± 2.7	8.9 ± 7.6	6.4 ± 5.2
Previous arrests	9.2 ± 3.9	6.9 ± 3.7	9.5 ± 3.7	7.2 ± 4.3
Committments	5.6 ± 3.3	3.8 ± 2.7	5.1 ± 3.6	3.8 ± 3.0

Also of note, the violent study group, as constituted, fairly nicely conforms to one representative of the problem of criminal violence in the U.S. Of all violent crimes committed by this group, 517, 2% were homicide, 6% forced rape, 60% robbery(9% of this armed), 22% aggravated assault, and 9 % others(kidnapping etc.) This compares with overall U.S. violence figures (1968) of 2% homicide , 5% forced rape, 44 % robbery, 48% aggravated assault,-computed from(4). Our study group is somewhat high on robbery, somewhat low on aggravated assault. Also nearly one third of all the prison committments for the studied violent men were for offens of violence. This is comparable to available national statistics. Over the criminal career of the "average" violent offender, 27% of his arrests are for crimes of violence.(15)

RESULTS-PERSONAL CHARACTERISTICS:

Initially, two race-controlled variables for all Lewisburg violent men, N=571, were compared the entire non-violent sample, N=287.

	BLACKS		WHITES	
	Violent(N=217)	Non-Violent(N=71)	Violent(N=354)	Non-Violent(N=2
Age of first arrest	17.3 ± 4.6	18.7 ± 5.4 *	18.1 ± 6.6	21.5 ± 8.0 ***
History of Juvenile committment	34%	20% *	35%	20% ***

* $P. < .05$

*** $P. < .001$

The following tables summarize other comparatative data of special interest. These results are the comparisons between the matched study groups, Total N=287 for each group. Data not presented in detail and showing no differences between the study groups was: religious affiliation, rural or small city childhood versus upbringing in a city of more than 250,000(1960 census), ordinal birth order, family size, childhood fire setting and cruelty to animals. This last item, however, was likely an unreliable one from this type of record review. Consistent with other reports(11,19) enuresis tended towards greater frequency in the violent group, 5%, versus the non-violent group 2%, $P. < .10$, but this factor was perhaps also underreported in the records.

DISCUSSION:

This paper is about aggressive criminals. Both groups of men are almost 34

years of age. They have passed their age of greatest expected violence.(4) This is some assurance that we are studying reasonably complete criminal careers.

The results, with minor exceptions, are highly congruent with well known studies of crime and delinquency.(1,2,10,20, 21, 22) There is indeed some continuity between criminality in general and criminal violence. Though this is a retrospective study, and thus can document only associations, not causes, the data support previous work implicating early anti-social identification, loss of father, anti-social behavior of father(in our data indicated by illegitimacy, alcoholism, and probably father loss(See,23), as intimately associated with the criminal process. A ranking of the variables of significance in our data parallels the results of Robbins et. al.(1,2) Most impressive is the differential in ages of first arrest of the sample, i.e. early identification; next comes the family data; the least impressive is social class of origin. Unfortunately we are missing the occupations of a large number of fathers of both samples, but this missing data was largely related to inadequate information on absent fathers or to father's anti-social behavior. Where fathers were present, and presumably less anti-social, their occupations did not distinguish between the samples. Additionally the data shows significant differences between violent and non-violent whites, but not blacks, on mother loss before age 2, a finding reminiscent of Bowlby's earlier work.(24)
From these findings we conclude:

1. The roots of aggressive criminality are similar to that of anti-social behavior in general.

2. Criminal violence of the most frequent sort- that comitted by the "mixed", violent and non-violent,offender-(15) is associated with a significantly more severe loading on those prognostic or etiologic factors already identified for criminality as a whole.(1,2,10,20, 21,22)[2].

The implications of this portion of the data are:
1. Measures taken to understand and eliminate anti-social behavior in general will also have beneficial effects in decreasing criminal violence, i.e. socioecconomic change, institutional reorganization, court and prison reform, ending of racism(30), extending of the results of experimental neuro-psychology.(5)

FOOTNOTE
2. Our study does not of course identify the dynamic processes which accout for the development of this aggressive behavior pattern. Absence of models for appropriate identification(20,21), lack of parenteral controls or discipline(21,25, 26), disruption of dependency bonds (27), family discord(10,28), child-beating and other abuse(29), have been implicated by others and may partly account for the

2. Every justification is offered for the intensive examination and treatment of those individuals identified as anti-social at an early age, i.e. juvenile delinquents; the younger the age the worse the prognosis(15), and probably the greater the likelihood of future violence.(31) In the prevention of recidivism lies part of the answer to criminal violence.

The second major finding of the study is that even compared to non-violent controls, the criminally violent exhibit extreme and repetitive life failure. Despite, on average, normal intelligence, the violent prisoners have more frequently failed to complete high school, failed to establish or keep families, have less frequently entered the military, and have done more poorly in the military when they were accepted. Also there are indications that their violent behavior is reflected in minor repetitive acts, distinct from their violent crimes. For example the black violent prisoners are more frequently arrested for disorderly conduct, the white violent prisoners engage in more institutional violence than do the white controls. This data, together with the data on early criminal identification, for all Lewisburg violent, not only the study groups, support a view that much criminal violence occurs within the context of an extreme behavior disorder. The violence can be viewed as a further symptom of that disorder, or a reaction to it.(32)

Comparing blacks and whites across the categories offers additional conclusions. Alcohol is overly implicated in the criminal careers of both violent groups; for blacks there is an increased diagnosis of alcoholism; for the whites increased alcohol arrests. Drugs(heroin), though more used by blacks, do not distinguish between the matched samples of either race. These are expected findings. Also noteworthy is that we found no variables where there were significant differences between the violent and non-violent samples which ran in opposite directions between the two races. The age of first arrest for a combined sample of all studied blacks(violent and non-violent) is less than that for all studied whites, but the age of first arrest for the studied black and white violent samples is identical, 16.5 years. This reinforces Robbins conclusion(2) that early identification, regardless of race, is of greatest value in criminal prognostication. In these respects black and white violence is of one piece.

Looking at the magnitude of the variables reported, however, it is apparent thatviolent and non-violent blacks more nearly resemble each other than do violent and non-violent whites. Three variables are reported of significance for blacks alone on Tables 1 and 2, six variables for whites alone on these tables(excluding social class, a derivative of two of the six variables).

In part this is a function of sample size, but it is also true that, normatively, blacks are being exposed to family constellations and conditions of social living, i.e. low occupation, poor education, which we have shown to be differentially associated with violent criminal behavior among whites. This supports Pierce's contention that much of black violence can be conceptualized as counter-violence.(30)

The remaining areas for comment are other aspects of the psychiatric history and the psycho-biologic findings. Here we are on less certain ground comparatively because it is possible that violent offenders are more likely retained within the prison compound when they manifest some of the abnormalities documented than when they do not. This may partly, though we expect not wholly, account for the higher prevalences of psychosis, epilepsy, and retardation noted within the violent group. Also we have not ourselves verified these diagnoses, though at the least they can be regarded as evidence of some past "extreme mental state" for these men. "Extreme mental states" are of particular interest to our group. For the last three years we have studied a hospital out-patient violent group, generally self-referred, and characterized by initial presentation with affective discharges of rage, loss of control, and sometimes self-destruction.(33) To what extent these patients overlap with offender populations is unknown, especially because there is so little known about the actual mental state of offenders at the time of the commission of their crimes. Our clinical experience in prisons suggests that certainly not all violent offenders are dyscontrol cases or explosive personalities. It is at least conceivable that nervous apprehension, fear, righteous anger or determination, satisfaction etc., in addition to rage, might be frequent affects accompanying acts of criminal violence, especially in "mixed" offenders- those who thieve one time, assault the next, a common pattern.(15) This is a critical issue for the psychiatrist. His expertise in the management of violent behavior will likely be of greatest value when some abnormal mental state accompanies or triggers the violence rather than when it is a manifestation of an ego-syntonic or culturally determined behavior pattern.

In this regard the data on "extreme mental states" within the samples is useful and provocative. 23% of the violent sample have a history of suicide attempts or gestures, or psychosis, or epilepsy, or spells- compared to 13% of non-violent sample with a history of at least one of these phenomena, $P. < .001$. The differential between samples, 10%, climbs to 13% if the diagnosis of retardation is included, $P. < .001$, declines to 9% if both retardation and suicide

are excluded, $P. < .01$. From these figures, plus our clinical experience we propose that somewhere between one-tenth and one-fifth of the violent prisoners resemble our out-patient group, but more than 80% do not. This conclusion is also partly based on the rather low incidence of suicide attempts or gestures in the violent sample as a whole(9%- not different than the non-violent subjects), and their low rate of self referral to psychiatrists, less than 18%.(See also,13) This compares with our out-patient group, 48% history of suicide attempts or gestures, 59 % history of voluntary psychiatric contacts.(33) Mac Donald, in one of the rare controlled studies in this area, has reported a disparity in a history of suicide attempts as the most significant differential between an out-patient "threat-to-kill" group versus convicted homicide offenders.(6) Further study in this area is obviously required in order to establish what % of offenders are "pathologically" violent as opposed to "criminally" violent.(34) Our estimate of one-tenth to one-fifth of prisoners "pathologically" violent compares with findings of Conrad and Spencer, 12% of California offenders "pathologically" violent, the majority of the remainder"criminally" violent.(34)

Two "harder" biologic parameters require mention. Our findings of equal heights for the violent and non-violent men, with an equal % of men in each group six feet in height or more, fails to support the study of Nielson et. al. who reported increased criminality in tall patients.(35) It is unlikely that an influence of XYY karyotypes will be so easily demonstrated in mixed criminal populations. The differences in the weights between our violent and non-violent samples might also fall into the category of "unlikely to be repeated," but the finding is intriguing. Despite equal heights the violent weigh less than the non-violent, perhaps indicating a greater muscularity. Such a finding would be consistent with the work of the Gluecks(36) and might, if pursued, be another evidence of the continuity between criminality as a whole and criminal violence.

TABLE 1
DEMOGRAPHY

	BLACKS		WHITES		TOTAL(BLACKS AND WHITES)	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)	Violent(N=287)	Non-Violent(N=287
Not married[1]	90%	77% *	75%	67%	79%	70% *
High school graduate	6%	17% *	15%	29% ***	12%	26% ***
Inmate[2] occupation	6.3 ± 1.0	6.2 ± 1.2	6.0 ± 1.2	5.3 ± 1.5 ***	6.1 ± 1.1	5.6 ± 1.5 ***
Social[3] class 5	81%	71%	71%	51% ***	73%	56% ***
S.A.T.[4]	5.5 ± 3.0	6.1 ± 2.7	6.9 ± 3.1	7.3 ± 3.1	6.5 ± 3.1	7.0 ± 3.0
I.Q.[5]	94 ± 13	96 ± 15	104 ± 13	107 ± 12	102 ± 14	104 ± 14

P. $<$ .05

* P. $<$ .01

** P. $<$ .001

Variables of significance. Blacks: not married X^2 4.2, d.f.1; high school grad. X^2 4.78, d.f.1;
Whites: high school grad. X^2 12.87, d.f.1, occupation, t=5.29, d.f., 430;
social class X^2 18.3, d.f.1
Total: not married X^2 6.1, d.f.1; high school grad. X^2 17.3, d.f.1;
occupation t=4.9, d.f. 572; social class X^2 18.4, d.f.1

. single, separated divorced

. mean of ratings 1-7(Hollingshead) , highest occupation= 1; lowest =7

3. Inmate social class, father's occupation(social class of origin) is on Table 2

. Standard Achievement Test, verbal aptitude test administered on admission to all prison inmates, grade equivalency

. Revised Army Beta I.Q., non-verbal test given on admission to prison to all inmates. Exams were located for:
Blacks; Violent, N=66, Non-violent, N= 69 Whites; Violent, N=193, Non-violent, N= 200
Total Exams; Violent, N=259 , Non-Violent, N=269

FAMILY AND PERSONAL HISTORY

TABL

	BLACKS		WHITES		TOTAL(BLACKS AND WHITES)	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)	Violent(N=287)	Non-Violent(N=287)
Lost mother <21.	12%	15%	9%	3% *	9%	6%
Lost mother <15	28%	31%	27%	21%	27%	23%
Lost father <22.	40%	27%	15%	10%	21%	14% *
Lost father <15	70%	56%	49%	40%	54%	44% *
Illegitimate	30%	13% *	7%	2% *	12%	5% ***
Father's 3. occupation	5.8 ± 1.5	5.9 ± 1.4	5.4 ± 1.4	5.3 ± 1.3	5.5 ± 1.4	5.5 ± 1.3
Father alcoholic	10%	16%	26%	15% **	22%	16% *
Sibs(any)4. criminal	19%	26%	30%	21% *	28%	22%
Honorable5. military career	33%	43%	32%	45% *	32%	45% *

* P. < .05

* P. < .01

**P. < .001

Variables of significance. Blacks: illegitimate X^2 6.13,d.f.1

Whites: illegitimate X^2 4.60,d.f.1; father alcoholic X^2 7.69,d.f.1 criminal sibs X^2 4.11,d.f.1; honorable military career X^2 4.72,d.f.1 mother loss X^2 5.20, d.f.1

Total: father loss X^2 4.32,d.f.1; (<2); father loss X^2 5.55,d.f.1,(<15) illegitimate X^2 9.67,d.f.1; father alcoholic X^2 4.24,d.f.1; honorable military career X^2 5.17, d.f.1

2. divorce, separation, abandonment, death

1. divorce, separation, abandonment, death, criminal committment

3 mean of ratings 1-7(Hollingshead), father's occupation, if known. The absent fathers' occupations were often inadequately documented and account for the diminished N's for this variable. For blacks: Violent, N=42, Non-violent, N=45; for whites: Violent, N=143, Non-violent, N=150; Totals: Violent, N=185, Non-violent, N=195

4 Not all inmates had sibs, for blacks: Violent, N=55, Non-violent, N=61; for whites: Violent, N=180, Non-violent, N=171 Totals: Violent, N=235, Non-violent, N=242

5 Honorable discharge without qualifications for men serving in the military. For blacks: Violent, N=18, Non-violent, N=37; forwhites: Violent, N= 111, Non-violent, N= 140; Totals: Violent, N= 129, Non-violent, N= 177.

PSYCHIATRIC HISTORY
TABLE 3

	BLACKS		WHITES		TOTAL(BLACKS AND WHITES)	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)	Violent(N=287)	Non-Violent(N=287)
sychiatric[1]. istory in ilitary-yes	0%	17%	22%	11% *	18%	12%
lcoholic[2].	24%	8% *	46%	39%	40%	32% *
eroin Use	41%	39%	10%	11%	18%	18%
ver psychotic[2].	10%	4%	13%	7% *	12%	6% **
omosexual[3].	6%	10%	17%	6% ***	14%	7% **
istory of iicide ttempts or estures	3%	4%	10%	7%	9%	6%

P. $<$.05

\+ P. $<$.01

\+* P. $<$.001

Variables of significance. Blacks: alcoholic X^2 6.28,d.f.1
Whites: Psychiatric history in military X^2 5.10,d.f.1, homosexual X^2 11.89,d.f.1
Psychoses X^2 5.20,d.f.1
Total: alcoholic X^2 5.30,d.f.1, psychoses X^2 6.92,d.f.1, homosexual X^2 7.32,d.f.1

For men ever serving in the military, see Table 2, for N's

For diagnostic criteria, explanation of these high prevalences, see (13)

Designated homosexual by prison adjustment records, past or present, casework reports, self-report etc.

CRIMINAL HISTORY

TABLE 4

	BLACKS		WHITES		TOTAL(BLACKS AND WHITES)	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)	Violent(N=287)	Non-Violent(N=287)
Age of first arrest	16.5 ± 4.0	18.7 ± 5.4 **	16.5 ± 5.0	21.5 ± 8.0 ***	16.5 ± 4.8	20.8 ± 7.5 ***
Juvenile Committment	35%	20% *	43%	20% ***	41%	20% ***
Acts of[1] Institutional Violence/man/ Yr.(mean)	.09 ± .24	.09 ± .40	.10 ± .39	.03 ± .17 *	.09 ± .35	.05 ± .25
Drunk arrests/ man(mean)	.25 ± .78	.14 ± .14	.68 ± 2.2	.35 ± 1.1 *	.58 ± 2.0	.30 ± 1.0 *
Disorderly Arrests/man (mean)	.65 ± 1.0	.20 ± .57 ***	.44 ± 2.1	.37 ± 1.3	.49 ± 1.9	.33 ± 1.2

P. < .05

* P. < .01

** P. < .001

Variables of significance. Blacks: Age first arrest t=2.73,d.f.140;juvenile committment X^2 4.51,d.f.1 disorderly arrests t=3.23,d.f.70

Whites: Age first arrest t=6.19,d.f.215; juvenile committment X^2 28.75,d.f.1 institutional violence t=2.16,d.f.215;drunk arrests t=1.97,d.f.215

Total: ages first arrest t=8.05,d.f.286,juvenile committment X^2 32.69,d.f.1 drunk arrests t=2.11, d.f.286

. This data is controlled for time spent in the penitentiary(at the time of the record review) on the present sentence. Violent men had longer sentences and had spent longer amounts of time incarcerated for their present crime.

TABLE 5
PSYCHO-BIOLOGY

	BLACKS		WHITES		TOTAL(BLACKS AND WHITES)	
	Violent(N=71)	Non-Violent(N=71)	Violent(N=216)	Non-Violent(N=216)	Violent(N=287)	Non-Violent(N=287
Height(inches)	69.7 ± 2.8	70.1 ± 2.1	70.0 ± 2.9	70.0 ± 2.8	69.9 ± 2.9	70.0 ± 2.7
Height ≥ 72inches	24%	28%	29%	27%	28%	28%
Weight,lbs. (mean)	164 ± 25	168 ± 25	169 ± 25	177 ± 45 *	168 ± 25	175 ± 41 *
Ever psychotic	10%	4%	13%	7% *	12%	6% **
Epilepsy[1]	7%	0%	3%	1%	4%	1% *
Spells[2]	6%	0%	5%	4%	5%	3%
Retardation[3]	9%	6%	5%	1%	6%	2% **

Dermatoglyphics- To be reported later

* P. < .05

** P. < .01

*** P. < .001

Variables of signficance. Blacks:
Whites: weights t=2.32,d.f.215, psychoses X^2 5.20,d.f.1
Total: weights t=2.47,d.f.286, psychoses X^2 6.92,d.f.1,epilepsy X^2 5.58,d.f.1
retardation X^2 6.69,d.f.1

1. Ever diagnosed"epileptic" on medical records. In most cases this meant the man had "epilepsy" and an abnormal E.E.G. or he had had a seizure witnessed by medical personnel. (See 13)

2. A history of discontinuities of consciousness, probably not seizures, but which we were unable to further classify

3. Diagnosed retarded by medical or psychologic report or by I.Q. =<70.

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VIOLENT AND NON-VIOLENT PRISONERS, A COMPARISON # 2

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INTRODUCTION:

Violence in jails and prisons is increasing. This is a topic of considerabl interest for psychiatrists. A close analysis of prison violence will have many benefits. These include:

1. furnishing a better clinical understanding of the causesand management of violent behavior in general.
2. providing a model for human violence, one capable of study and manipulation, i.e. controlled organizational change, psychopharmacologic trials etc.
3. developing useful skills for psychiatrists which will enable them to gain acce be valuable, to the prison system. Such expertise might be the needed opening wedg for more psychiatric consultation within jails and prisons, an area of great priority.(1)

Recently several studies in this area have appeared.(2,3,4,5). These studies demonstrate the usefulness of life history data in studying violent prisoners- and, furthermore, show that such violence is not a random occurrence but is associat with previously established behavior patterns of the violent subjects. Three of these studies(2,4,5), however, deal mainly with group phenomena(prison outcasts, rioters). The remaining study(Kinzel) deals with acts of individual violence, but the subjects were closely studied on only one major paramter, body buffer zone, and the numbers of subjects were small. The present study attempts to complement these works by studying a large number of men who have committed acts of violence within a prison setting, but who are presently members of the general prison population.

The first question we address is similar to that in the previously delivered paper. Can social, psychologic, or biologic parameters distinguish prisoners who are violent from those who are not? Additionally the study delineates the temporal relationship between violent acts in prison and lengths of inmate stay. This relationship provides further understanding of the psychology and phenomenolog of violence.

METHODS:

The methods in this study are similar to those reported for the previous Lewisburg studies.(1,6). At the time of the complete record review several uses were planned for the data; detailed information was therefore recorded for every inmate(N=1154), about all of his known violent behavior in prison. Specificall we noted the type and circumstances of the violent behavior and its data of occurrence. This data was compared with the inmate's date of reception into prison in order to temporally place the violent act within the mans' prison stay.

We then defined a study group of violent men in prison, defined as all prisoners with a history of either fights, minor assaults, or serious assaults (See below) during their present sentence. 157 men were so identified, 13% of the entire population. A subgroup of these men(46), 4% of the population,were defined as "especially violent" because of the seriousness of their acts. The entire violent group, between them,committed 249 violent acts; 146(63%) fights; 35 (14%) minor assaults, and 58(23%) serious acts. Of the 58 serious acts, committed by 46 of the men, 19(33%) were assaults resulting in bodily harm to the victim, 7(12%) were murder of one inmate by another, 8(14%) were forced sodomy, and 24(41 were assaults by inmates on prison personnel. Most of these events were so serious as to result in loss of prison good time(time off sentence for good behavior) or for additional sentences for the offending men.

The entire group of violent men, and the smaller subgroup of"especially violent" men are the study subjects of this paper. Both groups are compared with selected controls as follows. Every prison violent man was individually matched with a prisoner of the same race and who had been in prison for the same amount of time(at the time of the record review) on his present sentence. This matching procedure assured that both violent study subjects and controls had been equally "at risk" for violence during their prison stays.

The groups are perfectly matched. For all violent men and controls: blacks=67 whites =90; "especially violent" men and controls: blacks =16, whites= 30.[1] All violent men had been in prison 3.5 $\pm$ 3.1 yrs.(average) on their present sentence, controls 3.4 $\pm$ 3.0 yrs.(average); all "especially violent" men had been in prison 4.1 $\pm$ 3.6 yrs.(average), controls 4.0 $\pm$ 3.5 yrs(average)

The parameters studied, their meaning, and the statistical procedures employed are similar to the previously discussed study.(6).

Finally each group, versus its control, was studied separately by race, i.e. all the white violent prisoners were compared with all the white controls; the "especially violent" black prisoners were compared with black controls etc.

RESULTS:

None of the groups differed significantly in their lengths of present sentence: all violent men 11.5 $\pm$ 9.6 yrs, controls 10.6 $\pm$ 7.4 yrs; "especially violent" men 11.0 $\pm$ 6.4 yrs, controls, 10.6 $\pm$ 7.6 yrs. This data excludes life sentences, also no different between the groups: all violent men 7 life sentences, controls 6, "especially violent" 3, controls 1. This negative result is, however,

1. 14 other men in the prison, Puerto Ricans, and with a history of prison violence, were not studied.

partly influenced by the matching procedure employed, i.e, a violent prisoner who had served 10 years of a life sentence was likely to be matched with another long stay(possibly life) prisoner.

NEGATIVE FINDINGS IN AGREEMENT WITH PREVIOUS STUDY:

The following variables showed no significant differences or trends between the groups and are not further reported: religious affiliation, ordinal birth order, enuresis, fire-setting and cruelty to animals. As before(6), however, it is likely that these last three variables are undereported in this type of record review.

BLACKS VERSUS WHITES:

Comparisons between black and white groups showed results very similar to the previous study(6) There were no variables measured where there were significant differences between the two sets of black, or the two sets of white, samples which ran in opposite directions between the two races.

Variables of significance between white groups, but not black, were:

	All PRISON VIOLENT(N=90)	CONTROL(N=90)	"ESPECIALLY VIOLENT"(N=30)	CONTROL(
1.Inmate occupation[1.]	6.2 ± 1.0	5.7 ± 1.4 **	6.6 ± .70	5.4± 1.7
2.High school graduate	11%	21% *	3%	40%[2.]
3.Social class 5	79%	67%	90%	53% **
4.Longest period[3.] free <6 months	19%	7% *	22%	0%[2.]
5, History of suicide attempts or gestures	20%	8% *	17%	3%[2.]

1. For explanation of meaning of this variable and others in this study see similar tables(6)

2. Chi Square inappropriate due to small sample size in one cell, significance obvious.

3, For men with any previous committments this is the longest period free, ever, before reincarceration. For all prison violent(white) N=67, control N= 69; for "especially violent" (white) N=23, control N=23.

* P. < .05

**P. < ,01

***P. <.001

(Though on these variables the black groups did not show significant differences, in all cases the trends between the various groups were in similar directions as for the whites.)

Variables of significance between black groups but not whites were:

	ALL PRISON VIOLENT(N=67)	CONTROL(N=67)	"ESPECIALLY VIOLENT"(N=16)	CONTROL
1. Father alcoholic	21%	6% *	19%	0%[1]
2. Father's occupation	6.2 ± .90	5.6 ± 1.7 *	6.3 ± .50	5.4 ± 1.9
3. Family[2] size	5.4 ± 3.0	4.3 ± 2.7 *	5.7 ± 2.5	5.1 ± 3.5

1. Chi square inappropriate due to small sample size in one cell, significance obvious

2. Total number of maternal children, where known: all prison violent, N=63; control, N=58; "especially violent" N=15, control N=14.

* P. < 05.

(Though on these variables the white groups did not show significant differences, in all cases the trends between the various groups were in similar directions as for the whites.)

OTHER RESULTS:

Comparisons between the total groups(black and white) violent and "especially violent" versus controls are given in Tables 1-5. The tables are constructed so as to parallel the previous study.(6) In table 4"drinking arrests" and "disorderly arrests," which showed no significant differences between the groups, are omitted, though these were included previously.(6)

TIMING OF INSTITUTIONAL VIOLENCE

Table 6 compares two groups of prisoners using the"life table" method. Two samples of prisoners were individually matched by race and by length of sentence. In this table the "violent" sample all have a history of legal convictio for a crime of "Major "violence(See 6). The "non-violent" sample has a negative history for any of these crimes. Acts of institutional violence, any type, are noted in relation to the man's date of reception to prison. At each time period, 1 year, 2 years etc., the total number of men diminishes because some men are discharged from the prison, but the percentages(violent acts within the period/total men"at risk") can still be compared. The graph shows that men with a history of violence committ more acts of prison violence than do the "non-violent" men, and that, over time, the violent acts in prison of men with no previous history of violence diminish in incidence, whereas those of the "violent" men continue.

DISCUSSION:

This paper, and the previous study(6) permit several conclusions about violent behavior; these will be discussed sequentially:

1. The major findings of the previous study(6)- early identification(age of first arrest); a history of antisocial fathers(absent, alcoholic); and extreme life failure on many parameters, are also differentially present in the life histories of institutionally violent men, when these men are compared to matched prisoner controls. This adds weight to the conclusions of the previous study. Violence as a form of human behavior tends to be repetitive. Even in jail violent behavior is manifested more by persons with a previous history of some violence, and by persons with life histories similar to those violent on the stree This consistency of behavior, despite variability of environmental setting(street or prison) indicates:

a. Compared to the prediction of individual dangerousness(7,8) <u>at present not at all reliable</u>, the prediction of levels of violence for large groups of men rests on a more adequate data base.

b. Speedy attention to childhood variables associated with adult male violence(i.e. early identification, absent or alcoholic fathers) is required. The association of these variables with violence in more than one setting points to their importance in the probable genesis of violent behavior in general.

c. The prison is a very suitable arena for the assessment and study of violence. Studies of men who are violent in prison are probably generalizable to the overall problem of criminal violence.

2. Despite above similarities between the street and institutionally violent mne, the groups show some interesting contrasts. The following variables, <u>significant in the previous study</u> show no differences between the institutionally violent and the prisoner controls: marital status, alcoholic status, illegitimacy, psychiatric history in the military, psychosis, epilepsy, and weights. The lack of significance for the varibles of marital status and psychosis may, in this study, be related to the differential in present ages between study subjects and controls(the samples were not age matched for this study since any age differential was of experimental interest). With the passage of time the younger, institutionally violent, sample may exhibit even more marital disintegration, psychotic episodes etc. This may also be true for alcoholic diagnoses. But lack of significance on this variable likely has another explanation. Federal prisons are generally free from alcohol. Men violent in prison are therefore likely to be those for whom

the stimulus of intoxication is not necessary to produce violence.(9,10) Absence of alcohol in prison may in fact partially explain why the absolute levels of institutional violence are so low, though many aggressive men are confined together.(See below). The other variables which show no significance in this study versus the previous one(6) are illegitimacy, epilepsy, and weights. We can simply note them and wonder whether larger sample size might have shown more impressive differences. For the entire prison violent group the trends on the varibles were in expected directions.

3. The following variables showed significant differences between institutionally violent men and controls were none was present in the previous study: I.Q., childhood residence in rural area or small city(for the "especially violent" men); family size and father's occupation(blacks only); and "longest period free" and suicide attempts or gestures. The "longest period free" and suicide data indicate other area in which institutionally violent men exhibit greater instability and probably greater impulsivity than do the controls. For the blacks, family size and father's occupation probably correllate with each other, and both varibles with social class of origin. This finding is reminiscent of Robbins'recent work(11) where social class of origin was demonstrated of greater significance for black criminality than for white. The I.Q. data, as well as that on retardation, is also compatible with previous reports.(Boslow et. al)(12). One of the burdens of the retarded in institutions is an increased number of fights, though not necessarily any more extrme violence. The retarded at Lewisburg were not found in excess in the "especially violent " group, though they are in excess in the total violent group. We can, however, offer no certain comments for the finding of increased rural or small city childhoods for the institutionally violent. This finding, if validated, would be of great theoretical interest. Suseptability to the stresses of overcrowding and forced segregation may be greatest among those men not accustomed to these conditions from earlier childhood experiences.

4. The other differences between black and white groups in this study parallel the findings of the previous study(6), and will not be further discussed. On varibles of inmate social class all blacks(those violent in prison, or controls) again resemble each other more so than do all whites.

5. The final area for comment is the material relating to the timing and psychology of institutional violence. As Kinzel has noted(3) there is little

available information as to the level of institutional violence within prisons. (His estimate is 5% of men institutionally violent.) This study provides such data. Even including fights and minor assaults, violent events within prisons are not frequent, less than .06 events/man/yr, very serious events less than .02 events/man/yr. Men with a history of violence on the street, however, are more likely, at any given time in their incarceration, to be violent than are men with no such history. All prisoners are most likely to be violent in prison during the earlier parts of their sentences. Reiger(13) has studied the same phenomena for suicides(also at Lewisburg). Though there have been few systematic studies of prisoner adaptation to jail, this data, plus our clinical experience, provides a consistent picture. The period immediately post incarceration is a difficult one for the men whose adaptation to stress is generally motoric rather than reflective. Aggressive events, directed towards both others and self, are likeliest at this time. Conflicts in the homosexual sphere are also pressing during this time when each man is forced to define his position vis-a-vis his fellow inmates.(14) This homosexual pressure probably never abates, as indicated by the present data, and by Kinzel's findings.(3) Homosexuality is highly significantly associated with prison violence, even if we discard from the data the 8 events of actual sodomy (8/249 total events of violence) used to ascertain the study group.

However, as incarceration continues the psychology of violence is perhaps less related to the acutely stressful events of reception, and more related to habitual behavior patterns of the men who are violent. Our findings in this regard are striking. The prison violence of otherwise "non-violent" men decreases dramatically with time, perhaps in response to the nearness of the men to their date of release, to "burning out", "wising up" or simply to aging. Whatever the explanation, this seems less operative for the previously "violent" men. They, as a group, continue to maintain a level of violence nearly equal to that upon their reception to prison. This finding is not an artifact of remaining long sentences for the "violent" men versus the "non-violent" since the samples studied were matched by length of sentence as well as(via the "life table" method) by length of time already served. The point here is again really the main one of the study. Violent behavior of some men, albeit a small percentage of the total violent, is repetitive in nature. Further psychiatric study of this phenomena is surely warranted.

END

TABLE ONE
DEMOGRAPHY

	ALL PRISON VIOLENT(N=157)	CONTROLS(N=157)	"ESPECIALLY VIOLENT"(N=46)	CONTROLS(N=46)
. Age(yrs.)	28.7 ± 6.1	36.3 ± 9.3 ***	27.1 ± 5.8	35.8 ± 8.9 ***
. Not married[1.]	78%	78%	95%	85%
. High school graduate	11%	23% **	7%	32% ***
. Inmate occupation	6.3 ± 1.0	5.9 ± 1.3 **	6.5 ± 1.0	5.7 ± 1.5 **
. Social class 5	80%	70% *	85%	61% **
. S.A.T.	6.4 ± 2.6	6.8 ± 3.1	6.7 ± 2.2	7.0 ± 3.5
. I.Q.[2.]	98 ± 14	103 ± 12 **	98 ± 14	104 ± 13 *
. Childhood in[3.] big city	44%	51%	27%	57% **

P. $<$ .05
* P. $<$ .01
** P. $<$ .001

. For meaning of this and all variables similar to previous study(6), see these tables.

. I. Q., Revised Beta, exams located for: All prison violent, N=152, control, N=147; "especially violent" N= 45,control, N=42

. Prior to age 15 lived in city of $<$ 250,000 population(1960 census)

TABLE TWO
FAMILY AND PERSONAL HISTORY

	ALL PRISON VIOLENT(N=157)	CONTROLS(N=157)	"ESPECIALLY VIOLENT"(N=46)	CONTROL(N=46)
1. Lost mother <2	11%	9%	7%	9%
2. Lost mother <15	30%	27%	32%	22%
3. Lost father <2	21%	17%	14%	11%
4. Lost father <15	57%	46% (Nearly *ChiSquare3.74)	38%	37%
5. Illegitimate	12%	7%	9%	7%
6. Family size[1.]	4.9 ± 2.8	4.3 ± 2.5 *	5.3 ± 2.6	4.4 ± 2.7
7. Father's[2.] occupation	5.6 ± 1.3	5.3 ± 1.5	5.3 ± 1.4	4.8 ± 1.6
8. Father alccholic	30%	17% **	32%	11% *
9. Sibs(any) crininal	25%	20%	30%	13%
10. Honorable[3.] military career	24%	44% *	5%	46%

* P.<.05
** P.<.01
*** P.<.001

1. Total number of maternal children where known; All prison violent N= 143, control N= 142; "especially violent"N= 42, control N=43

2. Where known. See(6). All prison violent N= 102, control N=112; "especially violent"N= 41,control N=40.

3. For those men who ever served. All prison violent N=62, control N=75; "especially violent" N=20, control N=24. Also for this variable Chi Square is inappropriate for the "especially violent" cell. Significance is obvious.

TABLE 1 (CONT'D)
PSYCHIATRIC HISTORY

	ALL PRISON VIOLENT(N= 157)	CONTROL(N=157)	"ESPECIALLY"VIOLENT(N=46)	CONTROL(N=46)
1. Psychiatric history in military, yes [1.]	20%	24%	21%	31%
2. Alcoholic	25%	31%	22%	33%
3. Heroin Use	15%	20%	11%	15%
4. Ever psychotic [2.]	13%	9%	15%	6%
5. Homosexual	37%	13% ***	44%	20% **
6. History of suicide attempts or gestures [2.]	15%	6% **	11%	2%

* P. <.05
** P. <.01
*** P. <.001

1. For number of men ever serving in military see Table 2

2. For "especially violent" cell Chi Square inapprropriate, significance obvious.

TABLE FOUR
CRIMINAL HISTORY

	ALL VIOLENT PRISONERS(N=157)	CONTROL(N=157)	"ESPECIALLY VIOLENT"(N=46)	CONTROL(N=46)
1. Age first arrest	16.7 ± 4.7	19.6 ± 8.0 **	16.7 ± 4.1	19.5 ± 8.8 *
2. Juvenile committment	40%	30% (nearly *ChiSquare3.79)	47%	37%
3. Longest period[1.] free<6 months	17%	5% **	19%	0%
4. Any history of[2.] violence	87%	76% *	83%	74%
5. Violent[2.] present offense	56%	44% *	63%	44%
6. Any history of[3.] "major"violence	65%	63%	61%	61%
7. "Major"violence on present offense	50%	43%	52%	41%

* P. < .05
** P. < .01
***P. < .001

1. For men with any previous committments this is the longest period free, ever, before reincarceration. For all prison violent N=106, control N=116; for "especially violent N=32, control N=36. Chi Square inappropriate for "especially violent cell, significance obvious.

2. This includes any previous history of conviction for a crime of violence, including assault, assault and battery, as well as crimes of "major violence." See(6), on either past or present sentences.

3. This category of violence is more restricted than 2.(Above) Men with history of only minor violence are included in the "no violence" category.

TABLE FIVE
PSYCHO-BIOLOGY

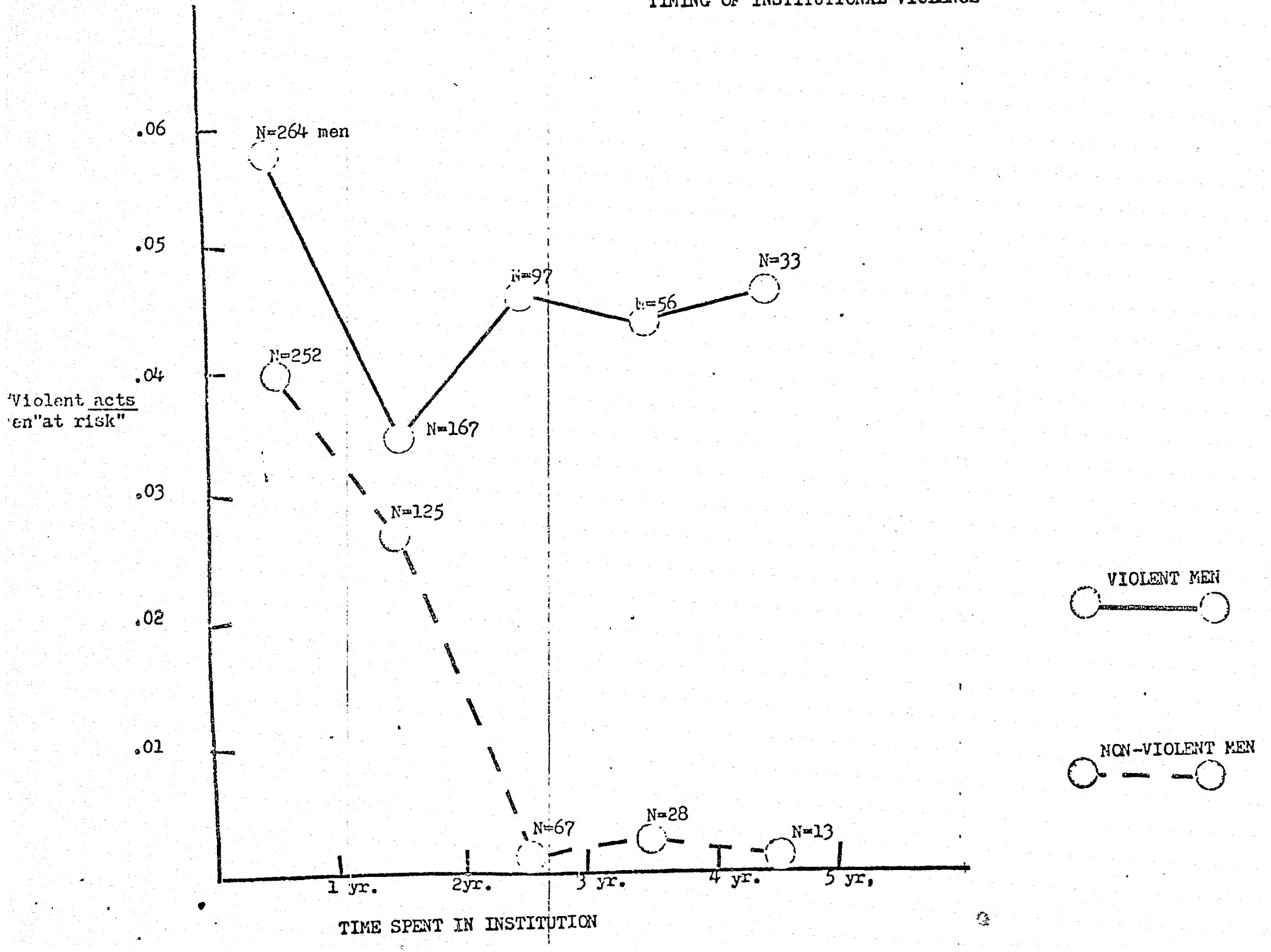
	ALL PRISON VIOLENT(N=157)	CONTROL(N=157)	"ESPECIALLY VIOLENT(N=46)	CONTROL(N=46)
Heights(inches)	70.6 ± 2.6	70.1 ± 2.8	70.9 ± 2.8	70.7 ± 2.5
Height ≥72 inches	33%	33%	43%	38%
Weights, lbs. (mean)	169.4 ± 25	171.3 ± 24	169.5 ± 23	167.9 ± 22
Ever psychotic[1].	13%	9%	15%	6%
Epilepsy	3%	2%	0%	0%
"Spells"	6%	2%	4%	2%
Retardation	14%	4% **	4%	11%

Dermatoglyphics- To be reported later

P.< 01.

For "especially violent"cell Chi Square inappropriate, significance obvious.

TIMING OF INSTITUTIONAL VIOLENCE



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